

EPA Region 5 Records Ctr.



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**PHASE II INVESTIGATION
FOR
MINNESOTA POLLUTION CONTROL AGENCY
VOLUNTARY INVESTIGATION AND CLEANUP**

**WESTERN MINERAL PRODUCTS SITE
MINNEAPOLIS, MINNESOTA**

Prepared for

W.R. Grace & Co.

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1.1 BACKGROUND

W.R. Grace & Co. (Grace) retained URS to conduct a Phase II Investigation (Investigation) of the former Western Mineral Products site. The Western Mineral Products site is comprised of four separate properties: 1720 Madison Street Northeast (currently Madison Complex and Panel Specialties); 1719 Madison Street Northeast (currently Paradise Autobody); and 1815 and 1801 Jefferson Street Northeast (currently Electramatic Inc. and a rental property owned by Mr. Arnold Gilbertson, respectively). The Western Mineral Products site is located in the city of Minneapolis, Hennepin County, Minnesota 55413 (Site). The Site is located in a portion of the Southeast Quarter of the Southwest Quarter of the Southeast Quarter of Section 11, Township 29 North, Range 24 West (USGS Quadrangle Map, Minneapolis North, Minnesota, 1967, revised 1993), (45 degrees, 0 minutes, 18 seconds, North Latitude; 93 degrees, 15 minutes, 15 seconds, West Longitude). The regional location of the Site is shown on Figure 1.

The Site is composed of four separate properties on 4.2 acres. Nystrom Access Doors at 1701 Madison Street Northeast, and Modern Machine & Engineering at 1707 Jefferson Street Northeast border the Site on the south, Jefferson Street Northeast borders the Site on the west. The Site is bordered on the North by 19th Avenue Northeast and the east by the BNSF Railroad right-of-way. The railway runs diagonally from the southeast to the northwest. A Boundary Survey including a Certificate of Survey drawing is presented as Figure 2. A Topographic Survey is presented as Figure 3. These figures are located in plastic sleeves under the Figures tab.

URS completed a Phase I Environmental Site Assessment (ESA) of the Site during September and October 2000. The Phase I ESA focused on asbestos issues identified by the Minnesota Pollution Control Agency (MPCA) and the U.S. Environmental Protection Agency (EPA). Western Mineral Products Inc. and Grace used the Site for the production of vermiculite products from 1937 to 1989. The Phase I ESA identified potential asbestos impacts detected in soil and dust samples collected by the MPCA and the EPA from in and around the Western Mineral Products building. Laboratory analysis detected asbestos minerals in several soil samples at levels greater than 1% by volume.

Comments from the MPCA regarding the Phase I ESA were submitted to URS and Grace on November 9, 2000. URS and Grace addressed the comments and responses are presented in the Phase I ESA Addendum presented in Appendix A.

A Phase II Investigation Workplan (Workplan) was developed based on the information revealed in the Phase I ESA. URS submitted the Workplan to the MPCA on October 30, 2000. Comments from the MPCA and Minnesota Department of Health (MDH) were received on November 16, 2000. Based upon the comments, proposed fieldwork was postponed and a revised Workplan was agreed upon with the MPCA. URS submitted the revised Workplan via email to the MPCA on December 2, 2000. The revised Workplan incorporated comments from the MPCA received on November 16 and November 30, 2000.

The MPCA also requested an Emission Control Plan (ECP) via electronic mail (e-mail) on November 30, 2000. URS submitted the ECP on November 30, 2000 and received comments to the ECP from the MPCA via e-mail on December 1, 2000. The comments were incorporated in the final ECP.

The December 2, 2000 Workplan was implemented on Monday, December 4, 2000.

1.2 PURPOSE

The purpose of this Investigation was to develop strategy to systematically evaluate and characterize asbestos contaminants in dust within the Western Mineral Products building, in Site soils, and in sediments in the stormwater catch basins on the Site. Objectives of the Workplan included the following:

- ◆ To determine the vertical and horizontal extent and magnitude of the asbestos impacts at the Site;
- ◆ To collect adequate information from the Site to develop a Response Action Plan (RAP), if cleanup is necessary.

The purpose of this Phase II Investigation report is to present the results of the Investigation, characterize the asbestos impacts, and delineate the extent of asbestos impacts at the Site.

1.3 REGULATORY STANDARDS

The regulatory standards used to compare clean areas from contaminated areas were based on the definition of asbestos-containing material (ACM) in the Minnesota Statutes, Chapter 326.71, Subdivision 3. The definition states that "Asbestos-Containing Material, means material that contains more than one percent asbestos by microscopic visual estimation by area." This standard was established as part of the MDH Asbestos Act of 1997. This standard is comparable to Part 40 of the Code of Federal Regulations (CFR), subpart M-National Emission Standard for Asbestos.

Air monitoring samples were compared to standards defined in Minnesota Statutes, Chapter 326 Subdivision 326.77, paragraph b, Indoor Air Standard. This standard states that until the rules become effective, asbestos remaining in the air following the completion of an abatement project shall not exceed 0.01 fibers greater than five microns in length per cubic centimeter of air (f/cc).

Asbestos concentrations are compared to these standards in this report.

1.4 GEOLOGIC SETTING

1.4.1 Topography

According to the USGS Minneapolis North, Minnesota 7.5-Minute Quadrangle, elevation of the Site is approximately 850 feet based on National Geodetic Vertical Datum of 1929 (NGVD). The Site is relatively flat. The area surrounding the Site slopes gently west toward the Mississippi River approximately 4,500 feet west of the Site.

1.4.2 Surface Soil and Geology

Surface soil at the Site and surrounding area has not been mapped. Since a large portion of Hennepin County is occupied by the city of Minneapolis and densely built-up suburban areas, a large portion of the city, including the Site, was excluded from the soil survey. Urban

development and reworking of the soils during construction made it impossible to classify the origin of the soils.

Surface geology consists of Pleistocene deposits, deposited during advancement of the Grantsburg Sublobe of the Des Moines lobe of the Late Wisconsinan period of glaciation. During the recession of the Grantsburg Sublobe, glacial streams including the Mississippi River deposited sediment referred to as Terrace Deposits along their banks. Terrace deposits in the area of the Site are classified as Upper Terrace Deposits. Upper Terrace Deposits include sand, gravelly sand and loamy sand, overlain by thin deposits of silt, loam or organic sediment. The deposits are covered by fill where heavily developed. The thickness of the Upper Terrace Deposits is typically less than 50 feet.

1.4.3 Bedrock

The Platteville and Glenwood Formations are the uppermost bedrock in the area deposited during the Middle Ordovician. The Platteville Formation is light olive gray, thin to medium-bedded dolomite limestone and dolomite containing some shale beds. The Glenwood Formation is green, fissile shale containing some argillaceous sandstone. The combined thickness is 25 to 35 feet. The Platteville and Glenwood Formations overlie the St. Peter Sandstone. Depth to bedrock at the Site is expected to be less than 50 feet.

1.4.4 Hydrogeology

Based on the Water Table System map in the Geologic Atlas of Hennepin County, shallow ground water is expected to flow southwest toward the Mississippi River. The depth to shallow ground water is expected to be less than 20 feet below grade.

The uppermost bedrock aquifer is the Prairie Du Chien-Jordan Aquifer. The Prairie Du Chien Group and Jordan Sandstone form the most heavily used aquifer in the county. The Prairie Du Chien-Jordan bedrock lies beneath the St. Peter Sandstone. Regional ground water in the bedrock aquifer is also expected to flow southwest toward the Mississippi River. Lower portions of the St. Peter Sandstone, composed of mudstone, siltstone and shale interbedded with very coarse sandstone, confine the Prairie Du Chien-Jordan Aquifer. The depth to the potentiometric surface of the Prairie Du Chien-Jordan Aquifer is expected to be at least 75 feet below grade. The susceptibility of ground water in the Prairie Du Chien-Jordan Aquifer to contaminants in this area is low to moderate.

Photographs taken during the investigation activities are presented in Appendix B.

2.1 AIR MONITORING

URS and the Institute for Environmental Assessment (IEA) completed an air-monitoring survey on the interior air of the Western Mineral Products building on October 12, 2000. A report, documenting sampling methods, sample areas and analytical results, was submitted to the MPCA on October 23, 2000.

Air monitoring was also conducted during Phase II sampling activities at the Site. Personal and area monitoring were conducted at various locations during the fieldwork. Monitoring was conducted on the interior and exterior of the Site. Methods used for the air monitoring are described in the ECP presented in Appendix C. The MPCA approved the ECP on December 1, 2000. IEA, under subcontract to URS, provided pumps and filter cassettes for the air monitoring program. Cassettes were analyzed by IEA using phase-contrast microscopy (PCM) in accordance with NIOSH 7400 upon completion of daily monitoring. If the samples contained fibers greater than 0.01 f/cc, the sample was submitted to RJ Lee Group, Inc., (RJ Lee) of Monroeville, Pennsylvania and analyzed by transmission electron microscopy (TEM) using NIOSH method 7420.

Eight personal air and twelve ambient air samples were initially analyzed using PCM NIOSH Method 7400 A rules. All particles with a length >5 micrometers and aspect ratio $\geq 3:1$ were counted. The samples were then analyzed by RJ Lee, when fibers were identified using TEM NIOSH Method 7402, Issue #2, August 15, 1994 or TEM EPA Level II analysis. The analysis for asbestos fibers consisted of fiber morphology, visual selected area electron diffraction (SAED) and elemental chemical analysis by energy dispersive spectroscopy (EDS), supplemented by measurement and interpretation of micrographs of several SAED. The samples were analyzed at magnification of 1,000X. Particles meeting the definition of a fiber >5 μ m in length, >0.25 μ m in diameter and having a length to width aspect ratio $\geq 3:1$ were classified as chrysotile or amphibole.

The ambient air area samples were analyzed using the EPA Level II method. The analysis for asbestos fibers consisted of fiber morphology, visual SAED and elemental chemical analysis by EDS, supplemented by measurement and interpretation of micrographs of several SAED patterns. The samples were analyzed at magnification of 20,000X. Particles meeting the definition of a fiber length to width aspect ratio $\geq 3:1$ and having substantially parallel sides were classified as chrysotile or amphibole following definitions developed by Mr. George Yamate.

2.2 ASBESTOS SURVEY OF SILO STRUCTURES AND SURROUNDING SOIL

An asbestos survey of the two concrete block silos and concrete vault structure north of the silos was conducted by IEA on November 14, 2000. The asbestos survey was conducted in anticipation of demolition of the silos and concrete vault. Samples were collected from the building materials, visible debris and surrounding soil. IEA's MDH certified inspectors collected the samples. Four samples were collected from building materials consisting of caulk; paint; and cement block and mortar. Eleven samples were collected from debris and soil within the structures. Ten samples were collected from surface soil within 0.5 feet of the surface

surrounding the silos, where visible evidence of vermiculite, actinolite or tremolite materials were observed.

Building material samples were analyzed by IEA using polarized light microscopy (PLM) and dispersion staining methods as described in the EPA Method for the Determination of Asbestos in Bulk Building Materials. RJ Lee analyzed debris and soil samples. Debris and soil samples were analyzed using the PLM modified method outlined in EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials.

2.3 INTERIOR SURFACE SAMPLING

Settled dust and bulk samples were collected from within the Western Mineral Products and Paradise Autobody buildings located at 1720 and 1719 Madison Street Northeast, respectively. Sampling was conducted in areas where accumulated dust, debris and/or vermiculite were present. Samples were collected from areas where current workers in the building could disturb the dust. Samples were collected by IEA asbestos inspectors certified by the MDH.

IEA attempted to collect dust samples using the microvac technique described in the Workplan. However, based on the quantity of dust and debris in the sampling locations, bulk or microvac sampling technique or a combination of both were used depending on the volume of sample material at each location. At several sample locations, a bulk sample was collected in a sample bag, and a microvac sample was collected of any remaining dust. Determination for the use of bulk or microvac sampling technique was established at the time of sampling dependant upon the location and quantity of settled dust, debris and/or vermiculite.

Forty-five samples were collected from the two buildings. Interior sample locations were labeled with orange tags in the field. The tags were marked with the sample identification and date. The samples were collected from workstations or in areas most likely to be disturbed by work activities. These locations were also the most likely areas where employees could encounter dust and debris. The non-work area sample locations were selected in areas where increased airflow and/or vibration were present. Samples were collected from windowsills, structural beams, light fixtures, ductwork, heat registers, drop ceilings and in the elevator pit. Interior dust sample locations are shown on Figure 4A – 4D.

RJ Lee analyzed the samples by PLM using EPA method 600/R-93/116 (modified). Analysis using TEM is still in progress. Information will be submitted when it received from RJ Lee. All samples less than 1.0 % asbestos by weight were point counted. The types of asbestos detected in the samples were determined using the method described in Section 2.1.1 of the Workplan. Chrysotile fibers were identified by the SAED method, and amphiboles were identified using a combination of EDS and SAED.

2.4 SOIL BORINGS

Forty-eight soil borings labeled GP-1 through GP-48 were advanced at various locations across the Site during the week of December 4, 2000. Weather during the week consisted of temperatures ranging from -5° to 26° F, with occasional snow showers. December 4th was fairly windy. Winds on the other days were relatively calm.

Boring locations were concentrated in four areas of the Site: the former waste rock pile; the grass parkway portion east of the Western Mineral Products building and silo area; the excavated area on the north end of the Site; and the former outdoor intake, process, storage and loading dock areas. Several of the borings required relocation based on utility location. Borings were also placed through the concrete pavement on the Electramatic property portion of the Site, the parking area and next to the west side of the building on the Modern Machine & Engineering property to help delineate the extent of potential asbestos. Boring locations are shown on Figure 5.

Thein Well Company Inc. advanced soil borings, with a hydraulic direct-push GeoProbe unit. Borings were advanced to depths ranging from 8 to 16 feet below grade (fbg). The majority of borings were terminated at 8 fbg. Borings were generally advanced to native soil or 8 fbg. Boreholes were decommissioned by filling with bentonite chips and located with a survey stake or marker. Soil boring locations were surveyed by URS for vertical and horizontal control. Excess borehole cuttings and acetate liners were collected and placed in plastic lined, 55-gallon labeled drums on Site.

A URS professional geologist and MDH certified asbestos inspector conducted the sampling. Soil near the bottom of each sample interval was examined for the presence of vermiculite and briefly described. Borehole logs were prepared and include general information pertaining to soil characteristics.

Samples were collected in a four-foot stainless steel macrocore sampler lined with a four-foot long acetate liner. Samples were cut into approximately two-foot long sections to allow for shipping. Tubes were capped with plastic end caps, labeled and sealed with tape. Each liner section was labeled with a distinct borehole number, vertical depth interval and orientation, date, and time. One hundred ninety five (195) sample core liners were submitted under chain-of-custody for analysis to RJ Lee. All samples were analyzed by PLM using EPA Method 600/R-93/116 (modified). RJ Lee retained the spoil samples for TEM analysis pending review of PLM analysis results by Grace and the MPCA.

Three soil samples from the upper two feet of the borehole (approximately ground surface to 0.25 fbg; 0.75 to 1.0 fbg; and 1.75 to 2.0 fbg) were analyzed from each borehole. The lab attempted to visually identify asbestos minerals or vermiculite and analyzed that portion within the given sample interval. One sample beyond the two-foot depth was analyzed from each deeper one-foot interval based on visual identification by the lab. If the lab did not visually identify asbestos minerals or vermiculite beyond the two-foot depth, one sample was analyzed from each section interval, typically to the four to six foot interval, native soil, or where asbestos was not detected in the previous interval.

2.5 TEST PIT EXCAVATION

Ten test pits labeled TP-1 through TP-10 were excavated at the Site by Environmental Resources Inc., (ERI) on December 7 and 8, 2000. The locations of the test pits are shown on Figure 5. Test pits were excavated with a Takeuchi Model TBO35 small rubber-tracked backhoe. The test pits were excavated to depths ranging from 5 to 8 fbg with dimensions averaging 3 feet wide and 10 feet long. Excavated material was temporarily stockpiled on Site, wetted and covered with plastic. The test pits were backfilled and compacted on the same day as excavation. Plastic sheeting was replaced upon completion of excavation activities.

TP-1 and TP-2 were excavated north of the concrete vault along the former rail spur in the suspected location of the former unloading and intake area. TP-3 was excavated north of the former process area and exterior concrete dock. TP-4 was excavated north of the Western Mineral Products building outside a former port in the concrete block wall in an area where vermiculite was observed on the ground surface. TP-5 was excavated near the former "waste rock" pile on the west end of the Western Mineral Products building. TP-6 was excavated west of the southwest corner of the building in an area that was identified to contain vermiculite during previous trenching by the electric utility. TP-7, TP-8 and TP-9 were excavated on the southwest side of the building near building access doors and the concrete loading dock. TP-10 was excavated in the grass area just south of the silos.

A URS professional geologist and an IEA MDH certified asbestos inspector collected the soil samples. Two soil samples were collected from each test pit in 50-milliliter (ml) sealable, rigid plastic sample containers. Samples were collected from areas where vermiculite, actinolite or tremolite were visually identified. Samples were labeled TP-1-1 or TP-1-2 according to their respective location. Each test pit was photo-documented and photographs are presented in Appendix B. An IEA MDH certified asbestos inspector collected twenty (20) samples. Samples were submitted under chain-of-custody to RJ Lee and analyzed by PLM using EPA Method 600/R-93/116 (modified). RJ Lee retained the soil samples for TEM analysis pending review of PLM analysis results by the Grace and the MPCA.

2.6 STORMWATER CATCH BASIN SAMPLING

Eight storm sewer catch basins on the Site, labeled CB-1 through CB-8, were physically and visually inspected on December 11, 2000 for the presence of sediment in the bottom sump area. Only three of the catch basins had a sufficient amount of sediment to allow for collection of a sample. One sample was collected from each of the three catch basins. Catch basin samples were labeled CB-1, CB-2 and CB-4, with numbers corresponding to their respective catch basin. Catch basin locations are shown on Figure 5.

Three samples were collected by a URS asbestos inspector certified by the MDH. The samples were collected in 50-ml sealable, rigid plastic containers and labeled. Samples were submitted under chain-of-custody to RJ Lee and analyzed by PLM using EPA Method 600/R-93/116 (modified). RJ Lee retained the soil samples for TEM analysis pending review of PLM analysis results by the Grace and the MPCA.

2.7 MANAGEMENT OF FIELD DERIVED WASTE

All sampling materials, excess soil, and waste, including disposable personal protective equipment (PPE) and other sampling waste were placed in 10-mil plastic lined 55-gallon drums. Wastes within the liners were wetted prior to closure of the drum. The labeled containers are stored on Site pending disposal. The waste will be disposed at a local landfill approved for asbestos disposal. Procedures for hauling and disposal will comply with 40 CFR 61, Subpart M (i.e., NESHAP), state, regional and local regulations.

3.1 AIR MONITORING

An air-monitoring program was completed on the interior air of the Western Mineral Products building on October 12, 2000. A report was submitted to the MPCA on October 23, 2000 describing sampling methods, sample locations and analytical results. Findings of the program are briefly summarized below.

Thirty-five (35) ambient air samples were collected from 16 areas inside and outside the Western Mineral Products building. Thirteen personal samples were obtained from four Panel Specialties employees, representing 25% of the workforce in the Panel Specialties offices of the building. Five area samples and one personal sample could not be analyzed due to particulate overloading. The overloading was most likely caused by smoke from welding and cigarettes. Despite collecting the samples at lower airflow rates and switching out the cassettes as needed, the filters could not be analyzed. Samples were collected during typical working conditions and hours, from 5:00 AM to approximately 4:00 PM.

RJ Lee analyzed the personal samples using the PCM method in accordance with NIOSH 7400 and TEM using the NIOSH 7402 method. The area samples were analyzed by the TEM Level II method, per Mr. George Yamate.

All of the sample results were less than the Minnesota Indoor Air Standard, Minnesota Statute 326.77, of 0.01 fibers greater than five microns in length per cubic centimeter of air (f/cc). Documentation and laboratory reports are contained in the Air Monitoring Results report submitted to the MPCA on October 23, 2000.

Personal and area air monitoring was also conducted as part of the ECP during investigative or intrusive activities conducted on the Site during December 2000. Samples were collected daily in filter cassettes. The samples were analyzed daily at the IEA lab by PCM. IEA laboratory reports and associated chain-of-custody are presented in Appendix D. When PCM analysis results by IEA were >0.01 f/cc the samples were submitted to RJ Lee for TEM analysis and point counting. Three personal air samples collected on December 4, 8, and 15, 2000 and two ambient air samples collected on December 4, 2000 were submitted to RJ Lee for TEM analysis.

PCM analysis was also conducted on the personal air monitoring samples submitted to RJ Lee. PCM results of personal air monitoring samples are summarized in Table 1. TEM analyses of the three personal air samples are summarized in Table 2. TEM analysis of the two ambient air samples, and the field blanks, are summarized in Table 3. TEM analysis results were reported by RJ Lee as f/cc or structures per cubic centimeter (S/cc). Analysis of the five air samples, both personal and ambient, submitted for TEM analysis, detected 0.0 asbestos fibers. Laboratory analysis reports and associated chain-of-custody from the RJ Lee TEM air analyses are also presented in Appendix D.

3.2 ASBESTOS SURVEY OF SILO STRUCTURES AND SURROUNDING SOIL

URS and IEA conducted an asbestos survey of the two concrete block silos and concrete vault structure north of the silos on November 14, 2000. The asbestos survey report, including laboratory analysis reports, is presented in Appendix E. Sample locations are shown on the figure included with the report.

Four building material samples were collected from the structures. The samples were analyzed by IEA using PLM analysis. Asbestos was not detected in any of the building material samples.

Ten soil samples were collected from around the outside of the structures. These are labeled 1B through 10B in the IEA report. PLM laboratory analysis of the samples detected actinolite or tremolite asbestos in three of the samples (3B, 5B and 8B) ranging from 1.3% to 3.7%. Asbestos was detected in samples collected on the southwest side of the silos, east of the silos, and northeast of the silos. These sample locations are shown on Figure 5.

Eleven debris and soil samples, 11B through 18B, and 23B, 24B, and 25B, were collected from within the two silos and concrete vault structures. PLM analysis of these samples detected actinolite or tremolite asbestos at 2.4% in sample 24B. Sample 24B was collected inside the concrete vault structure north of the silos.

3.3 INTERIOR SURFACE SAMPLING

Forty-five (45) debris/dust samples were collected from the interior of the Western Mineral Products and Paradise Autobody buildings. Sample locations are shown on Figures 4 (A-D). Forty-two (42) samples were collected in the Western Mineral building (1B – 36B and 40B – 45B) and three samples were collected in the Paradise Autobody building (37B, 38B, and 39B). Samples were initially laboratory analyzed using PLM methodology. TEM analysis is currently being completed and when the results become available they will be submitted to the MPCA. Laboratory analysis reports and associated chain-of-custody are presented in Appendix F. The interior surface samples are summarized in Table 4.

Due to the welding, grinding and cutting activities that are performed on a daily basis in the former Western Mineral Products building, this facility has a significant build-up of dust and, therefore, it was necessary to predominantly collect bulk samples in lieu of microvac samples.

Laboratory analysis of the 45 samples detected asbestos in 11 of the samples. Asbestos greater than 1.0% was detected in only one sample (41B). This sample was collected from a beam in the first floor metal roofed storage area on the north end of the brick three-story former Western Mineral Products building. PLM analysis of the three samples collected in the Paradise Autobody building did not detect any asbestos.

3.4 SOIL BORINGS

One hundred ninety five (195) sample core liners were collected from soil borings GP-1 through GP-48 and submitted under chain-of-custody to RJ Lee for laboratory analysis. Soil boring locations are shown on Figure 5. Two hundred three (203) samples from various depths were analyzed using PLM methodology. Laboratory analysis reports and associated chain-of-custody for the soil core samples are presented in Appendix G. A soil-boring log was prepared for each soil boring. Soil boring logs are presented in Appendix H.

Soil encountered in the soil borings ranged from coarse-grained gravel and sand to sandy silt and clay. The depth of fill material on the Site ranged between approximately 4 and 14 fbg. The average depth of fill across the Site was estimated at 7 fbg. The fill material predominantly consisted of sand, gravel, and silt, with areas of cinder and vermiculite material. Cinder filled areas are mainly located in the unloading areas behind the silos and near the former railroad track

areas along the north side of the former Western Mineral Products building. Native soil consisted of gravel, sand and silt characterized as Upper Terrace Deposits. These materials appeared to be poorly sorted with some large cobble size rocks. The deepest depth at which vermiculite material was encountered was approximately 4.5 fbg. This material was found in the former "waste rock" pile area on the northwest corner of the building.

Two hundred three (203) soil samples were selected for PLM analysis from the 195 core liners shipped. Laboratory analysis of the soil samples is summarized in Table 5. Asbestos was detected in 95 of the soil samples. Asbestos greater than 1.0% was detected in 22 of the samples. Asbestos content of the samples ranged from 0 to 21.3%. The average asbestos content in the samples with asbestos detected greater than 0% is 0.93%. The average asbestos content in the samples with asbestos detected greater than 1.0% is 3.3%. Evaluation of asbestos contamination is provided in the Evaluation of Findings in Section 4.0.

3.5 TEST PIT EXCAVATION

Twenty soil samples were collected from 10 test pits labeled TP-1 through TP-10 and submitted under chain-of-custody to RJ Lee for laboratory analysis. Test pit locations are shown on Figure 5.

Stratigraphy of the soils encountered during test pit excavation are described below and shown on the photographs presented in Appendix B.

<u>TP-1</u>	<u>Dimensions: 2' wide, 8' deep, and 10' long</u>
0-2'	Sand, fine, some silt and cinders, some small pockets of vermiculite, sample TP-1-1, (Fill)
2-4'	Sand, fine, some gravel, and debris including rail spike, (Fill)
4-5'	Sand, (Fill)
5-6'	Silty sand, fine, black to dark brown with white, black, and orange material, sample TP-1-2, (Fill)
6-8'	Silty sand, with gravel, (Upper Terrace Deposits)
<u>TP-2</u>	<u>Dimensions: 3' wide, 8' deep, and 10' long</u>
0-2'	Sand mixed with vermiculite, sample TP-2-2, (Fill)
2-3'	Sand with cinders and vermiculite, sample TP-2-1, (Fill)
3-5'	Fine sand with stratified bedding, alternating black to brown (Fill-Upper Terrace Deposit)
5-8'	Fine sand, with some cobbles and gravel at 7 feet, (Upper Terrace Deposit)
<u>TP-3</u>	<u>Dimensions: 4' wide, 8' deep, and 11' long</u>
0-1'	Silty organic loam topsoil with vermiculite, trace gravel, sample TP-3-1 at 0-1', (Fill)
1-2'	Cinders and ash (Fill)
2-3.5'	Silty sand trace gravel with vermiculite, sample TP-3-2, (Fill)
3.5-5'	Fine sand, reddish brown to black, striated (Fill-Upper Terrace Deposit)
5-8'	Fine sand, dark brown (Upper Terrace Deposit)

SECTION THREE

Summary of Findings

TP-4
0-1.5' Dimensions: 4' wide, 8.5' deep, and 10' long
Silty sand and clay, with actinolite and tremolite less than 1" long, sample TP-4-1 at 0-1.5', (Fill)
1.5-2.5' Cinders mixed with vermiculite, sample TP-4-2 at 2-2.5' (Fill)
2.5-5' Fine sand, brown, some silt, with gravel and cobbles, trace vermiculite (Fill)
5-8.5' Fine sand, brown, with coarse gravel and cobbles, (Fill-Upper Terrace Deposits)

TP-5
0-2.5' Dimensions: 4' wide, 8' deep, and 10' long
Sand and gravel, little silt, (Fill)
2.5-4.5' Vermiculite, with tremolite and actinolite, "waste rock" vermiculite thickness less on north side of excavation, sample TP-5-1 at 3', sample TP-5-2 at 4.5', (Fill)
4.5-5' Silty sand, with clay, dark brown to black, (Fill)
5-8' Silty sand, with clay, black to dark reddish brown, some fine to coarse gravel, brown, (Upper Terrace Deposits)

TP-6
0-0.4' Dimensions: 3.5' wide, 5' deep, and 10' long
Silty sand, little clay, with vermiculite, tremolite and actinolite, sample TP-6-1 at 0.4', east wall, (Fill)
0.4-3' Sand and gravel, dark brown to black, some glass, sample TP-6-2 at 0.4' at north wall, (Fill)
3-3.5' Silty sand, fine, trace fine gravel to coarse sand, brown to dark brown (Fill-Upper Terrace Deposits)
3.5-5' Sand, poorly sorted, little fine to coarse gravel, (Upper Terrace Deposits)

TP-7
0-2' North Wall Dimensions: 3.5' wide, 5' deep, 10' long
Sand and gravel, and silt, with greenish vermiculite, actinolite and tremolite, sample TP-7-1 at 1', (Fill)
2-4' Sand and gravel, fine sand, some fine to coarse gravel, sporadic pockets of vermiculite, sample TP-7-2 at 3-4', (Fill)
4-5' Sand, poorly sorted, with fine to coarse gravel, (Upper Terrace Deposits)

TP-7
0-1' South Wall
Sand, with gravel, sporadic areas of vermiculite, tremolite and actinolite, (Fill)
1-3' Sand, fine, some silt, dark brown, (Fill)
3-4' Sand, poorly sorted, with fine to coarse gravel, (Upper Terrace Deposits)

TP-8
0-0.5' North Wall Dimensions: 2' wide, 6' deep, and 5' long
Sand and gravel, (Fill)
0.5-1.5' Silty gravel, 1" layer of vermiculite, tremolite and actinolite at 1.5', (Fill)
1.5-2.5' Silty gravel, with sand, brown, 1" layer of vermiculite at 2.5', sample TP-8-1 at 2', (Fill)
3'-5' Silty sand, with fine to coarse gravel, vermiculite lenses at 3', sample TP-8-2 at 3', (Fill-Upper Terrace Deposits)

<u>TP-8</u>	<u>West Wall</u>
0-0.5'	Sand and gravel, (Fill)
0.5-1'	Silty gravel (Fill)
1'-5'	Sand, fine to coarse, with fine to coarse gravel, brown, (Upper Terrace Deposits)

<u>TP-9</u>	<u>North and West Walls</u>	<u>Dimensions: 3' wide, 5.5' deep, and 8' long</u>
0-0.5'	Sand and gravel, (Fill)	
0.5-1'	Vermiculite layer, sample TP-9-1, (Fill)	
1-2.5'	Silty sand, trace gravel, dark brown, (Fill)	
2.5-3.5'	Sandy silt, fine to medium sand, moderate yellowish brown, (Fill-Upper Terrace Deposits)	
3.5'-5.5	Silty sand, with fine to medium gravel, and cobbles, (Upper Terrace Deposits)	

<u>TP-9</u>	<u>East Wall</u>
0-1'	Silty sand, little gravel and vermiculite, sample TP-9-2, (Fill)
1-2.5'	Silty sand, trace gravel, dark brown, (Fill)
2.5-3.5'	Sandy silt, fine to medium sand, moderate yellowish brown, (Fill-Upper Terrace Deposits)
3.5'-5.5	Silty sand, with fine to medium gravel, and cobbles, dark reddish brown, (Upper Terrace Deposits)

<u>TP-10</u>	<u>Dimensions: 3' wide, 8' deep, and 5' long</u>
0-2'	Sandy silt, dark brown, 1" layer of vermiculite at 2', sample TP-10-1 (Fill)
2'-3'	Sand, fine to medium, dark brown, sample TP-10-2 from center of wall at 2', (Fill)
3'-8'	Sand, fine to medium, brown, trace gravel, (Upper Terrace Deposits)

Samples from the test pits were analyzed using PLM methodology. Laboratory analysis reports and associated chain-of-custody from the test pit soil samples are presented in Appendix I. Laboratory analyses of soil samples collected from the test pits are summarized in Table 6.

Asbestos percentages greater than 1.0% were detected in all test pits, except TP-10. Asbestos detected in the test pits ranged from 0 to 11.0%. The highest percentage of asbestos was detected in TP-4 at 11.0%. The average asbestos content in the samples with asbestos detected greater than 1.0% is 4.2%. Evaluation of asbestos contamination is provided in the Evaluation of Findings, Section 4.0.

3.6 STORMWATER CATCH BASIN SAMPLING

Sediment was collected from three of the eight-stormwater catch basins on Site. Only three of the catch basins contained sufficient amounts of sediment to warrant collection of a sample. Samples were labeled CB-1, CB-2 and CB-4 to reflect their respective catch basin designation. Catch basins are labeled on Figure 5. Laboratory analysis of the three catch basin soil samples was conducted using PLM techniques and are summarized in Table 6. The laboratory analysis report and associated chain-of-custody from the catch basin samples are presented in Appendix J.

Actinolite/tremolite asbestos was detected in sample CB-2 at 1.4 %. CB-2 is located on the west end of the gravel driveway or parking area of the Western Mineral Products building. This catch basin ultimately discharges into the Mississippi River through a 66-inch corrugated metal pipe at 22nd Avenue Northeast and Marshall Street. The locations of this discharge, and the discharge from the east side of the Site are shown on Figure 1.

4.1 AIR MONITORING

Several fibers were detected using PCM analysis in the samples collected during the fieldwork. TEM analysis of these fibers did not detect asbestos in any of the samples.

4.2 ASBESTOS SURVEY OF SILO STRUCTURES AND SURROUNDING SOIL

Asbestos was not detected in any of the samples collected from the building materials in the silos or vault structures. Asbestos greater than 1.0 % was detected in only one of the debris or residual material samples collected inside the concrete vault structure north of the silos 2.4% in 24-B). Asbestos was detected ranging from 0.1% to 3.7% in the nine of the ten soil samples collected from the area surrounding the silo structures using PLM methodology. Only three of the samples contained asbestos greater than 1.0% (labeled 3B, 5B, and 8B). The analysis results from these three soil samples were incorporated with the soil boring and test pit soil sample information, and were used to help delineate approximate asbestos extent information described in Section 4.4. The locations of these soil samples are shown on the figure included with the Silo Asbestos Survey Report presented in Appendix E and are also shown on Figure 5.

4.3 INTERIOR SURFACE SAMPLES

Asbestos was detected by PLM analysis in one sample 41B, which was collected from the interior of the former Western Mineral Products building. The sample was collected from a beam within a western portion of the first floor of the sheet metal elevator storage area on the north side of the three-story brick former Western Mineral Products building. This area is currently not being used by the current owners of the Site. Further analysis of the samples by RJ Lee using the TEM method is forthcoming and will be submitted when received from RJ Lee.

4.4 SILO ASBESTOS SURVEY, SOIL BORING, TEST PIT AND CATCH BASIN SAMPLES

Information collected during the asbestos survey from soil in the silo area, soil boring samples, test pit samples and catch basin samples was incorporated within this section to help evaluate and describe the horizontal and vertical extent of asbestos contamination. Soil samples with asbestos detected at greater than 1.0% were used to delineate the extent of asbestos contamination on the Site.

Asbestos was detected greater than 1.0% at various depths in two large areas and fifteen small areas on the Site. Two of the smaller areas are located on the Modern Machine & Engineering property at 1707 Jefferson Street N.E. The locations of the approximate extents are shown on the Extent of Asbestos Contamination in Soil drawings presented as Figure 6 (A-E), and are described below.

The two large areas are described as follows:

- ◆ The area surrounding the silos and north of the building near the former off loading dock.
- ◆ The area north of the building in the area outside the former access port in the cement block wall now covered with metal.

The small areas are described as follows:

- ◆ The area south of the western silo near 3B.
- ◆ An area surrounding GP-29.
- ◆ An area surrounding GP-5.
- ◆ An area surrounding GP-15.
- ◆ The area on the southwest corner of the building in the location of TP-6 and CB-2.5
- ◆ An area surrounding GP-39.
- ◆ An area surrounding GP-8.
- ◆ An area in the gravel parking area west of the loading dock near the three-story brick former Western Mineral Products building in the location of TP-9.
- ◆ An area surrounding GP-43.
- ◆ An area in the gravel parking area on the southwest corner of the Site in the location of GP-44.
- ◆ An area on the northwest corner of the adjacent Modern Machine & Engineering property parking area in the location of GP-46.
- ◆ An area surrounding GP-47 on the Modern Machine & Engineering property west of the building.
- ◆ The former “waste rock” pile area on the northwest corner of the building in the location of TP-5 and GP-14.
- ◆ An area surrounding TP-8.
- ◆ An area surrounding TP-7.

Based on the investigation sampling results, the vertical extent is limited to 4.5 fbg. The horizontal extent is limited to the Site with the exception of the contamination on the Modern Machine & Engineering property. Figure 6 (A-E) shows the horizontal and vertical extent on five separate drawings, each showing contamination at various depths. Each depth interval is indicated by a different color. As seen on the figures, the majority of contamination between 0 and 1.0 fbg is limited to the Site. A small portion of asbestos contamination, between 0.5 and 2.0 fbg, is located on the Modern Machine & Engineering property. Asbestos contamination between 2.0 and 4.5 fbg is limited to the Site. Asbestos contamination greater than 1.0% does not extend onto the 1815 Jefferson Northeast property, the Burlington Northern Railroad right-of-way property, or the Nystrom Access Doors and Hatches property at 1701 Madison Street Northeast.

The asbestos detected in CB-2 was incorporated with the information shown in Figure 6A, with depth ranging from 0 to 0.5 feet below grade.

Based upon the observations in the field and the findings of the air, interior, and soil sampling and analysis during the fall of 2000, the following conclusions are offered:

- ◆ Air monitoring obtained during the air monitoring investigation conducted October 12, 2000, revealed all sample results were less than 0.01 f/cc.
- ◆ Air monitoring conducted during the Phase II field investigation activities during the week of December 4, 2000 revealed all sample results were less than 0.01 f/cc and no asbestos fibers were detected in the air samples collected.
- ◆ PLM analysis of samples collected from the interior of the buildings, revealed that asbestos greater than 1.0% is limited to the area of the sample from a beam in a small portion of the sheet metal roofed portion of the elevator area north of three-story brick Western Mineral Products building. Asbestos was not detected in the Paradise Autobody building or other portions of the Western Mineral Products building. These results will be amended when the TEM analyses of the interior surface samples are completed.
- ◆ PLM analysis of soil samples collected on the Site, revealed that the vertical extent of asbestos greater than 1.0% is limited to the upper 4.5 fbg in several areas of the Site. The horizontal extent is limited to the Site, with the exception of two areas on the Modern Machine & Engineering property at 1707 Jefferson Street N.E.
- ◆ A meeting to discuss development of a Response Action Plan will be scheduled with the MPCA after the MPCA completes review of this Phase II Investigation. The response action will consist of excavation of the areas where asbestos was identified at levels greater than 1.0% in the Phase II Field Investigation. The excavated material will be disposed in a landfill permitted to accept asbestos containing materials. A detailed plan will be prepared for MPCA review and approval.

Reports Issued by Government Agencies:

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Other Reports:

URS Corporation, December 2000, "*Revised Workplan, Phase II Investigation Workplan*," URS Corporation, December 4, 2000.

URS Corporation, October 2000, "*Air Monitoring Results, Western Mineral Products Facility*," URS Corporation, October 23, 2000.

URS Corporation, October 2000, "*Phase I Environmental Site Assessment Report, Western Mineral Products Site*," URS Corporation, October 20, 2000.

Maps:

Bloomgren, Bruce A., 1985, "*Bedrock Geologic and Topographic Maps of The Minneapolis-St. Paul Urban Area, Minnesota*," Minnesota Geological Society, University of Minnesota, 1985.

Prasch, Raymond A., 1995, "*Lot Survey of 1720 Madison Street N.E.*," Raymond A. Prasch, Minnesota Registered Land Surveyor 6743, Lot Surveys Company, Inc., April 4, 1995.

United States Geological Survey, 7.5-Minute Topographic Quadrangle: "*Minneapolis North, Minnesota*," 1967, revised 1993.

United States Geological Survey, 7.5-Minute Topographic Quadrangle: "*Minneapolis South, Minnesota*," 1967, revised 1993.

United States Geological Survey, 7.5-Minute Topographic Quadrangle: "*New Brighton, Minnesota*," 1967, revised 1993.

United States Geological Survey, 7.5-Minute Topographic Quadrangle: "*St. Paul West, Minnesota*," 1967, revised 1972.

**TABLE 1: Summary of Personal Air Monitoring
PCM Analytical Results**

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

Field Sample ID	Date Sampled	Area Analyzed (sq mm)	Volume (Liters)	Fibers	Fields	Concentration (fibers/sq. mm)	Concentration (fibers/cc)
1-EP	12/4/00	0.785	643	5.0	100	<7.0064	<0.0042
24-EP	12/8/00	0.785	657	18.5	100	23.5669	0.0138
30-MV	12/15/00	0.785	424	30.5	100	38.8535	0.0353

NOTES: EP = Eric Poissant
MV = Mike Voss

Results were obtained by phase-contrast microscopy (PCM). The analysis was conducted in accordance with the NIOSH 7400, issue #2 method.

**TABLE 2: Summary of Personal Air Monitoring
 TEM Analytical Results**

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

Field Sample ID	Date Sampled	Filter Area (sq mm)	Volume (Liters)	Area Analyzed (sq mm)	Asbestos Fibers (fs)	Analytical Sensitivity (f/cc)	Asbestos Concentration (f/cc)	Total Fibers (Fs)
1-EP	12/4/00	385	643.00	0.3261	0.0	0.0018	<0.0018	2.0
24-EP	12/8/00	385	657.00	0.3261	0.0	0.0018	<0.0018	11.0
30-MV	12/15/00	385	424.00	0.3261	0.0	0.0028	<0.0028	16.5

NOTES: EP = Eric Poissant
MV = Mike Voss

Results are from the transmission electron microscopy (TEM) asbestos analysis, using the counting rules established by the NIOSH Method 7402, Issue #2, 8/15/94.

TABLE 3:**Summary of Ambient Air Monitoring
TEM Analytical Results**

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

Field Sample ID	Date Sampled	Filter Area (sq mm)	Volume (Liters)	Area Analyzed (sq mm)	Structures (Chrysotile)	Structures (Amphibole)	Analytical Sensitivity (S/Sq. mm)	Analytical Sensitivity (S/cc)	Concentration (S/sq. mm)	Concentration (S/cc)
2-West Side	12/4/00	385	771.00	0.0815	0.0	0.0	12.3	0.0061	<12.3	<0.0061
3-West Side	12/4/00	385	754.00	0.0815	0.0	0.0	12.3	0.0063	<12.3	<0.0063
4-Field Blank	12/4/00	385	Blank	0.0815	0.0	0.0	12.3	-	<12.3	-
5-Field Blank	12/4/00	385	Blank	0.0815	0.0	0.0	12.3	-	<12.3	-

NOTES: Results are from the transmission electron microscopy (TEM) asbestos analysis, using counting rules established by the NIOSH method 7402, Issue #2, 8/15/94.

TABLE 4: Summary of Interior Surface Sample Analytical Results

Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN

NOTES: Samples were analyzed with PLM modified method outlined in EPA/600/R-93/116

1.0 - Samples with asbestos detected at 1.0% or greater.

RJLG - R.J. Lee Group, Inc. Analytical Laboratory

TEM - Transmission electron microscopy

Field Sample ID	RJLG Sample ID	Date Collected	PLM Asbestos Content (%)	Mineral Identification	Sample Type	Location/ Material	TEM
1B	3027029	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above Plasma Cutter West End	
2B	3027030	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above Accupress Work Station West End	
3B	3027031	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above Drill Press Work Station East End	
4B	3027032	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above Welding Station (Center)	
5B	3027033	12/8/00	0.0	No Asbestoform Detected	Bulk	Window Sill Near Welding Station (Center)	
6B	3027034	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above North Side Old Loading Dock Doors	
7B	3027035	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above Storage Shelving (North)	
8B	3027036	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above East End Welding Station	
9B	3027037	12/8/00	0.0	No Asbestoform Detected	Bulk	On Top of Shop Office	
10B	3027038	12/8/00	0.0	No Asbestoform Detected	Bulk	Duct That Goes Into Break Room On Shop Side	
11B	3027039	12/8/00	0.0	No Asbestoform Detected	Bulk	Beam Above East Exterior Door	
12B	3027040	12/8/00	0.0	No Asbestoform Detected	Bulk	On Top of Heating Unit Near Office	
13B	3027041	12/8/00	0.0	No Asbestoform Detected	Bulk	Window Sill Above Stairs From Break Room	
14B	3027042	12/8/00	0.0	No Asbestoform Detected	Bulk Vac	Beam NE Corner Near Ramp	

TABLE 4: Summary of Interior Surface Sample Analytical Results

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

NOTES: Samples were analyzed with PLM modified method outlined in EPA/600/R-93/116

1.0 - Samples with asbestos detected at 1.0% or greater.

RJLG - R.J. Lee Group, Inc. Analytical Laboratory

TEM - Transmission electron microscopy

Field Sample ID	RJLG Sample ID	Date Collected	PLM Asbestos Content (%)	Mineral Identification	Sample Type	Location/ Material	TEM
15B	3027043	12/8/00	0.0	No Asbestoform Detected	Vac	Window Sill Ramp Lower Level	
16B	3027044	12/8/00	0.0	No Asbestoform Detected	Vac	On Top of Light Next To Paint Room Entrance	
17B	3027045	12/8/00	<0.25	Actinolite/ Tremolite	Vac	East Lower Level Room Window Sill	
18B	3027046	12/8/00	0.0	No Asbestoform Detected	Bulk Vac	Paint Room Above Metal Sliding Door	
19B	3027047	12/8/00	0.0	No Asbestoform Detected	Vac	Paint Track East End	
20B	3027048	12/8/00	<0.25	Actinolite/ Tremolite	Bulk Vac	East Window Paint Room (West Room Lower Level)	
21B	3027049	12/8/00	0.0	No Asbestoform Detected	Bulk	Main Stairwell Landing Between 1st & 2nd Level	
22B	3027050	12/15/00	0.0	No Asbestoform Detected	Vac	Room 306A 3rd Floor Heat Register	
23B	3027051	12/15/00	<0.25	Actinolite/ Tremolite	Vac	Room 306B 3rd Floor South Window	
24B	3027052	12/15/00	0.0	No Asbestoform Detected	Vac	Room 306B 3rd Floor South Light	
25B	3027053	12/15/00	<0.25	Actinolite/ Tremolite	Vac	3rd Floor Hallway In Front of Room 306A Top of Wall	
26B	3027054	12/15/00	0.0	No Asbestoform Detected	Vac	3rd Floor Commons Area Window Frame	
27B	3027055	12/15/00	0.0	No Asbestoform Detected	Vac	2nd Floor Main Hallway Light Across From Elevator	
28B	3027056	12/15/00	0.3	Actinolite/ Tremolite	Bulk Vac	2nd Floor Office Metal Support For Beam	

TABLE 4: Summary of Interior Surface Sample Analytical Results

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

NOTES: Samples were analyzed with PLM modified method outlined in EPA/600/R-93/116

1.0 - Samples with asbestos detected at 1.0% or greater.

RJLG - R.J. Lee Group, Inc. Analytical Laboratory

TEM - Transmission electron microscopy

Field Sample ID	RJLG Sample ID	Date Collected	PLM Asbestos Content (%)	Mineral Identification	Sample Type	Location/ Material	TEM
29B	3027057	12/15/00	0.0	No Asbestoform Detected	Bulk	2nd Floor Hallway Off Office Former Loading Dock	
30B	3027058	12/15/00	0.0	No Asbestoform Detected	Vac	Southwest Corner Above Ceiling On Ceiling Tile In Break Room	
31B	3027059	12/15/00	0.33	Actinolite/ Tremolite	Bulk	1st Floor Showroom Above Ceiling	
32B	3027060	12/15/00	0.0	No Asbestoform Detected	Vac	1st Floor Showroom Window Sill East Side	
33B	3027061	12/15/00	0.0	No Asbestoform Detected	Bulk	Floor of Elevator Shaft West	
34B	3027062	12/15/00	0.0	No Asbestoform Detected	Bulk	Floor of Elevator Shaft East	
35B	3027063	12/15/00	0.0	No Asbestoform Detected	Bulk	1st Floor On Top of Wall Middle Storage Room	
36B	3027064	12/15/00	0.0	No Asbestoform Detected	Vac	1st Floor On Top of Wood Beam in Middle Storage Area	
37B	3027065	12/15/00	0.0	No Asbestoform Detected	Bulk	Paradise Auto Above Ceiling at Hatch	
38B	3027066	12/15/00	0.0	No Asbestoform Detected	Bulk	Paradise Auto Paint Area SW Corner	
39B	3027067	12/15/00	0.0	No Asbestoform Detected	Bulk	Paradise Auto Paint Area Beam	
40B	3027068	12/15/00	0.0	No Asbestoform Detected	Bulk	Beam in 1st Floor Storage Area North of Showroom	
41B	3027069	12/15/00	1.3	Actinolite/ Tremolite	Bulk	Beam in 1st Floor Storage Area North of Showroom	
42B	3027070	12/15/00	0.0	No Asbestoform Detected	Bulk	Beam in 1st Floor Storage Area North of Showroom	

TABLE 4: Summary of Interior Surface Sample Analytical Results

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

NOTES: Samples were analyzed with PLM modified method outlined in EPA/600/R-93/116

1.0 - Samples with asbestos detected at 1.0% or greater.

RJLG - R.J. Lee Group, Inc. Analytical Laboratory

TEM - Transmission electron microscopy

Field Sample ID	RJLG Sample ID	Date Collected	PLM Asbestos Content (%)	Mineral Identification	Sample Type	Location/ Material	TEM
43B	3027071	12/15/00	0.2	Actinolite/ Tremolite	Bulk	Utility Room 210 on Floor	
44B	3027072	12/15/00	0.0	No Asbestoform Detected	Bulk	East Lower Level Room South Holding Area Grates	
45B	3027073	12/15/00	0.0	No Asbestoform Detected	Bulk	North Holding Area Grates	

TABLE 5: Summary of Soil Boring PLM Analytical Results
Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN

NOTES: Samples were analyzed by polarized light microscopy (PLM) modified method outlined in EPA/600/R-93/116

N/A - This section of the core was not analyzed.

1.0 - Samples with asbestos detected at 1.0% or greater.

fbg - Feet below grade

RJLG - R.J. Lee Group, Inc. Analytical Laboratory

Field Sample ID	RJLG Sample ID	Depth (fbg)	Sampled Section (in)	Date Collected	Asbestos Content (%)	Vermiculite Content (%)
GP-1	3026789	0-2'	0-1.5'	12/4/00	0	0
GP-1		0-2'	4-5.5'	12/4/00	0	0
GP-1		0-2'	9.5-11'	12/4/00	0	0
GP-1	3026790	2-4'	45-48"	12/4/00	0	0
GP-1	3026791	4-6'		12/4/00	N/A	
GP-1	3026792	6-8'		12/4/00	N/A	
GP-2	3026793	0.5-2'	0-1.75"	12/4/00	0	0
GP-2		0.5-2'	5.25-7"	12/4/00	0	0
GP-2		0.5-2'	12.25-14"	12/4/00	0	0
GP-2	3026794	2-4'	33-36"	12/4/00	0	0
GP-2	3026795	4-6'		12/4/00	N/A	
GP-2	3026796	6-8'		12/4/00	N/A	
GP-3	3026797	0-2'	0-2"	12/4/00	0	0
GP-3		0-2'	6.25-8.5"	12/4/00	0.1	1
GP-3		0-2'	15-17"	12/4/00	0	0
GP-3	3026798	2-4'	33-36"	12/4/00	0	0
GP-3	3026799	4-6'		12/4/00	N/A	
GP-3	3026800	6-8'		12/4/00	N/A	
GP-4	3026801	0-2'	0-2"	12/4/00	0.1	1
GP-4		0-2'	6-8"	12/4/00	0	0
GP-4		0-2'	14-16"	12/4/00	0.001	<1
GP-4	3026802	2-4'	33-36"	12/4/00	0	0
GP-4	3026803	4-6'		12/4/00	N/A	
GP-4	3026804	6-8'		12/4/00	N/A	
GP-5	3026805	0-2'	0-2.25"	12/4/00	4.2	1
GP-5		0-2'	6.75-9"	12/4/00	0.04	<1
GP-5		0-2'	15.75-18.25"	12/4/00	0	0
GP-5	3026806	2-4'	29.5-32.5"	12/4/00	0	<1
GP-5	3026807	4-6'		12/4/00	N/A	
GP-6	3026808	0-2'	0-2.25"	12/4/00	0.2	<1
GP-6		0-2'	7.5-9.75"	12/4/00	0.04	<1
GP-6		0-2'	17-19.5"	12/4/00	0.6	<1
GP-6	3026809	2-4'	33-36"	12/4/00	0.72	1
GP-6	3026810	4-6'		12/4/00	0	0
GP-6	3026811	6-8'		12/4/00	N/A	
GP-7	3026812	0-2'	0-2.25"	12/4/00	0	0
GP-7		0-2'	6.25-8.5"	12/4/00	0	0
GP-7		0-2'	15-17"	12/4/00	0	0
GP-7	3026813	2-4'	45-48"	12/4/00	0	0
GP-7	3026814	4-6'		12/4/00	N/A	
GP-7	3026185	6-8'		12/4/00	N/A	
GP-8	3026816	0-2'	0-0.75"	12/4/00	0.008	<1
GP-8		0-2'	2.5-3.5"	12/4/00	0.002	0
GP-8		0-2'	6.5-7.5"	12/4/00	1.42	<1
GP-8	3026817	2-4'	45-48"	12/4/00	0	0
GP-8	3026818	4-6'		12/4/00	N/A	
GP-8	3026819	6-8'		12/4/00	N/A	

TABLE 5: Summary of Soil Boring PLM Analytical Results
Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN

NOTES: Samples were analyzed by polarized light microscopy (PLM) modified method outlined in EPA/600/R-93/116

- N/A - This section of the core was not analyzed.
1.0 - Samples with asbestos detected at 1.0% or greater.
fbg - Feet below grade
RJLG - R.J. Lee Group, Inc. Analytical Laboratory

Field Sample ID	RJLG Sample ID	Depth (fbg)	Sampled Section (in)	Date Collected	Asbestos Content (%)	Vermiculite Content (%)
GP-9	3026820	0-2'	0-1.75"	12/4/00	0	0
GP-9		0-2'	4.5-6"	12/4/00	0	0
GP-9		0-2'	10.5-12"	12/4/00	0	0
GP-9	3026821	2-4'	33-36"	12/4/00	0	0
GP-9	3026822	4-6'		12/4/00	N/A	
GP-9	3026823	6-8'		12/4/00	N/A	
GP-10	3026824	0-2'	0-2.375"	12/4/00	0.2	2
GP-10		0-2'	7.25-9.5"	12/4/00	1.1	10
GP-10		0-2'	16.75-19"	12/4/00	0.003	<1
GP-10	3026825	2-4'	33-36"	12/4/00	0	0
GP-10	3026826	4-6'		12/4/00	N/A	
GP-10	3026827	6-8'		12/4/00	N/A	
GP-11	3026828	0-2'	0-1.5"	12/4/00	0.18	<1
GP-11		0-2'	4.5-6"	12/4/00	0.335	<1
GP-11		0-2'	10.5-12"	12/4/00	0.181	<1
GP-11	3026829	2-4'	33-36"	12/4/00	0.0157	1-3
GP-11	3026830	4-6'		12/4/00	0	<1
GP-11	3026832	6-8'		12/4/00	N/A	
GP-12	3026833	0-2'	0-2.5"	12/5/00	0.01	<1
GP-12		0-2'	7.75-10.5"	12/5/00	0.3	2
GP-12		0-2'	17.75-20.5"	12/5/00	0.5	1
GP-12	3026834	2-4'	29-32"	12/5/00	0.0145	<1
GP-12	3026835	4-6'		12/5/00	0	<1
GP-12	3026836	6-8'		12/5/00	N/A	
GP-13	3026837	0-2'	0-2"	12/5/00	0.033	1
GP-13		0-2'	6-8"	12/5/00	0.003	0
GP-13		0-2'	14-16"	12/5/00	0.0095	<1
GP-13	3026838	2-4'	33-36"	12/5/00	0	0
GP-13	3026839	4-6'		12/5/00	N/A	
GP-13	3026840	6-8'		12/5/00	N/A	
GP-14	3026841	0-2'	0-2.25"	12/5/00	0.7	1
GP-14		0-2'	7.25-9.75"	12/5/00	0.6	5
GP-14		0-2'	17-19.25"	12/5/00	0.8	2
GP-14	3026842	2-4'	33-36"	12/5/00	4.2	95.8
GP-14	3026843	4-6'		12/5/00	0	0
GP-14	3026844	6-8'		12/5/00	N/A	
GP-15	3026845	0-2'	0-2"	12/5/00	1.09	3
GP-15		0-2'	6.25-8.25"	12/5/00	0.46	20
GP-15		0-2'	14.375-16.25"	12/5/00	0	0
GP-15	3026546	2-4'	33-36"	12/5/00	0	0
GP-15	3026847	4-6'		12/5/00	N/A	
GP-15	3026848	6-8'		12/5/00	N/A	
GP-16	3026849	0-2'	0-1.875"	12/5/00	2.3	55
GP-16		0-2'	5.5-7.5"	12/5/00	1.31	42
GP-16		0-2'	13-15"	12/5/00	0.1	30
GP-16	3026850	2-4'	33-36"	12/5/00	0.03	5
GP-16	3026851	4-6'		12/5/00	0	0
GP-16	3026852	6-8'		12/5/00	N/A	

TABLE 5: Summary of Soil Boring PLM Analytical Results
Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN

NOTES: Samples were analyzed by polarized light microscopy (PLM) modified method outlined in EPA/600/R-93/116

- N/A - This section of the core was not analyzed.
1.0 - Samples with asbestos detected at 1.0% or greater.
fbg - Feet below grade
RJLG - R.J. Lee Group, Inc. Analytical Laboratory

Field Sample ID	RJLG Sample ID	Depth (fbg)	Sampled Section (in)	Date Collected	Asbestos Content (%)	Vermiculite Content (%)
GP-17	3026853	0-2'	0-1.875*	12/5/00	3.4	10
GP-17		0-2'	5.5-7.375*	12/5/00	4.7	10
GP-17		0-2'	12.5-14.5*	12/5/00	0	0
GP-17	3026854	2-4'	24-27*	12/5/00	0	20
GP-17	3026855	4-6'		12/5/00	N/A	
GP-17	3026856	6-8'		12/5/00	N/A	
GP-18	3026857	0-2'	0-2*	12/5/00	0	0
GP-18		0-2'	5.75-7.75*	12/5/00	0	0
GP-18		0-2'	13.75-15.75*	12/5/00	0	0
GP-18	3026858	2-4'	33-36*	12/5/00	0	0
GP-18	3026859	4-6'		12/5/00	N/A	
GP-18	3026860	6-8'		12/5/00	N/A	
GP-19	3026861	0-2'	0-1.75*	12/5/00	0	0
GP-19		0-2'	5.25-7*	12/5/00	4.02	96
GP-19		0-2'	12-14*	12/5/00	0	2-3
GP-19	3026862	2-4'	33-36*	12/5/00	0	10
GP-19	3026863	4-6'		12/5/00	N/A	
GP-19	3026864	6-8'		12/5/00	N/A	
GP-20	3026865	0-4'	0-2.25*	12/5/00	0.1	5
GP-20		0-4'	7-9.25*	12/5/00	0	0
GP-20		0-4'	16.125-18.5*	12/5/00	0	0
GP-20	3026866	4-6'		12/5/00	N/A	
GP-20	3026867	6-8'		12/5/00	N/A	
GP-21	3026868	0-2'	0-2.25*	12/5/00	0.4	<1
GP-21		0-2'	7.25-9.25*	12/5/00	0.08	<1
GP-21		0-2'	14.875-18.25*	12/5/00	0.2	<1
GP-21	3026869	2-4'	33-36*	12/5/00	0.5	99.5
GP-21	3026870	4-6'		12/5/00	0	0
GP-21	3026871	6-8'		12/5/00	N/A	
GP-22	3026872	0-2'	0-1.75*	12/5/00	0.2	<1
GP-22		0-2'	4.875-6.5*	12/5/00	0	0
GP-22		0-2'	11.25-13*	12/5/00	0	0
GP-22	3026873	2-4'	33-36*	12/5/00	0.003	90
GP-22	3026874	4-8'		12/5/00	0	<1
GP-23	3026875	0-2'	0-1.75*	12/5/00	0	10
GP-23		0-2'	4.875-6.5*	12/5/00	0	<1
GP-23		0-2'	11.25-13*	12/5/00	0	0
GP-23	3026876	2-4'	24-27	12/5/00	0	<1
GP-23	3026877	4-6'		12/5/00	N/A	
GP-23	3026878	6-8'		12/5/00	N/A	
GP-23	3026879	8-10'		12/5/00	N/A	
GP-23	3026880	10-12'		12/5/00	N/A	
GP-24	3026881	0-2'	0-2*	12/5/00	0.8	10
GP-24		0-2'	5.75-7.75*	12/5/00	21.3	64
GP-24		0-2'	13.5-15.5*	12/5/00	1.2	10
GP-24	3026882	2-4'	33-36*	12/5/00	5.4	35
GP-24	3026883	4-6'		12/5/00	0.139	30
GP-24	3026884	6-8'		12/5/00	0	0

NE of
Paradise Auto
Building

n. of
silo

TABLE 5: Summary of Soil Boring PLM Analytical Results
Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN

NOTES: Samples were analyzed by polarized light microscopy (PLM) modified method outlined in EPA/600/R-93/116

- N/A - This section of the core was not analyzed.
1.0 - Samples with asbestos detected at 1.0% or greater.
fbg - Feet below grade
RJLG - R.J. Lee Group, Inc. Analytical Laboratory

Field Sample ID	RJLG Sample ID	Depth (fbg)	Sampled Section (in)	Date Collected	Asbestos Content (%)	Vermiculite Content (%)
GP-25	3026885	0-2'	0-1.5'	12/5/00	0.04	1
GP-25		0-2'	4.75-6.375'	12/5/00	0.0998	<1
GP-25		0-2'	11-12.5'	12/5/00	0	0
GP-25	3026886	2-4'	33-36"	12/5/00	0	0
GP-25	3026887	4-6'		12/5/00	N/A	
GP-25	3026888	6-8'		12/5/00	N/A	
GP-26	3026955	0-2'	0-2.875'	12/6/00	0.04	<1
GP-26		0-2'	6.75-9'	12/6/00	0	0
GP-26		0-2'	15.875-18"	12/6/00	0	0
GP-26	3026956	2-4'	33-36"	12/6/00	0	<1
GP-26	3026957	4-8'		12/6/00	N/A	
GP-26	3026958	8-10'		12/6/00	N/A	
GP-26	3026959	10-12'		12/6/00	N/A	
GP-27	3026960	0-2'	0-1.875'	12/6/00	0	0
GP-27		0-2'	5.75-7.5'	12/6/00	0	0
GP-27		0-2'	13.125-15.25'	12/6/00	0	0
GP-27	3026961	2-4'	33-36"	12/6/00	0	<1
GP-27	3026962	4-8'		12/6/00	N/A	
GP-28	3026963	0-2'	0-2.25'	12/6/00	0.4	<1
GP-28		0-2'	7-9.25'	12/6/00	0	0
GP-28		0-2'	16.125-18.5'	12/6/00	0	0
GP-28	3026964	2-4'	33-36"	12/6/00	0.378	<1
GP-28	3026965	4-6'		12/6/00	0	0
GP-28	3026966	6-8'		12/6/00	N/A	
GP-28	3026967	8-10'		12/6/00	N/A	
GP-28	3026968	10-12'		12/6/00	N/A	
GP-28	3026969	12-16'		12/6/00	N/A	
GP-29	3026970	0-2'	0-2.5'	12/6/00	1.508	1-2
GP-29		0-2'	7.5-9.75'	12/6/00	0.603	0
GP-29		0-2'	17.75-19.75'	12/6/00	0.176	0
GP-29	3026971	2-4'	33-36"	12/6/00	0.101	<1
GP-29	3026972	4-6'		12/6/00	0	0
GP-29	3026973	6-8'		12/6/00	N/A	
GP-29	3026974	12-16'		12/6/00	N/A	
GP-30	3026975	0-2'	0-2.5'	12/6/00	0.002	1
GP-30		0-2'	7.5-10'	12/6/00	0.02	<1
GP-30		0-2'	17.5-20'	12/6/00	0	<1
GP-30	3026976	2-4'	33-36"	12/6/00	0	0
GP-30	3026977	4-6'		12/6/00	N/A	
GP-30	3026978	6-8'		12/6/00	N/A	
GP-30	3026979	8-10'		12/6/00	N/A	
GP-30	3026980	10-12'		12/6/00	N/A	
GP-30	3026981	12-13'		12/6/00	N/A	
GP-31	3026982	0-2'	0-2.125'	12/6/00	0	<1
GP-31		0-2'	6.75-9'	12/6/00	0	2
GP-31		0-2'	15.875-18"	12/6/00	0	0
GP-31	3026983	2-4'	33-36"	12/6/00	0	0
GP-31	3026984	4-6'		12/6/00	N/A	
GP-31	3026989	8-10'		12/6/00	N/A	
GP-31	3026890	10-12'		12/6/00	N/A	

Tree line E of Paradise

TABLE 5: Summary of Soil Boring PLM Analytical Results
Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN

NOTES: Samples were analyzed by polarized light microscopy (PLM) modified method outlined in EPA/600/R-93/116

N/A - This section of the core was not analyzed.
1.0 - Samples with asbestos detected at 1.0% or greater.
fbg - Feet below grade
RJLG - R.J. Lee Group, Inc. Analytical Laboratory

Field Sample ID	RJLG Sample ID	Depth (fbg)	Sampled Section (in)	Date Collected	Asbestos Content (%)	Vermiculite Content (%)
GP-32	3026891	0-2'	0-1.875*	12/6/00	1.4	10
GP-32		0-2'	6-8"	12/6/00	1	15
GP-32		0-2'	14-16"	12/6/00	1.7	3
GP-32	3026892	2-4'	33-36"	12/6/00	0	0
GP-32	3026893	4-6'		12/6/00	N/A	
GP-32	3026894	6-8'		12/6/00	N/A	
GP-33	3026895	0-2'	0-2.5"	12/6/00	0.02	0
GP-33		0-2'	7-9.375"	12/6/00	0	0
GP-33		0-2'	16.25-18.75"	12/6/00	0	0
GP-33	3026896	2-4'	33-36"	12/6/00	0	0
GP-33	3026897	4-6'		12/6/00	N/A	
GP-33	3026898	6-8'		12/6/00	N/A	
GP-33	3026899	8-10'		12/6/00	N/A	
GP-33	3026900	10-12'		12/6/00	N/A	
GP-34	3026901	0-4'	0-1.875"	12/6/00	0.5	20
GP-34		0-4'	5.75-7.5"	12/6/00	0.02	<1
GP-34		0-4'	13-15"	12/6/00	0.03	<1
GP-34	3026902	4-6'		12/6/00	N/A	
GP-34	3026903	6-8'		12/6/00	N/A	
GP-35	3026904	0-2'	0-1.875"	12/6/00	0.6	10
GP-35		0-2'	4.25-6"	12/6/00	0.06	2
GP-35		0-2'	12.125-14"	12/6/00	0.03	1
GP-35	3026905	2-4'	33-36"	12/6/00	0	0
GP-35	3026906	4-6'		12/6/00	N/A	
GP-35	3026907	6-8'		12/6/00	N/A	
GP-36	3026908	0-2'	0-2.125"	12/6/00	0	0
GP-36		0-2'	6.75-9.125"	12/6/00	0	0
GP-36		0-2'	15.875-18.25"	12/6/00	0	0
GP-36	3026909	2-4'	36-39"	12/6/00	0	<1
GP-36	3026910	4-6'		12/6/00	N/A	
GP-36	3026911	6-8'		12/6/00	N/A	
GP-37	3026912	0-2'	0-1.875"	12/6/00	0	0
GP-37		0-2'	5.25-6.875"	12/6/00	0	<1
GP-37		0-2'	12.125-13.75"	12/6/00	0	0
GP-37	3026913	2-4'	33-36"	12/6/00	0	0
GP-37	3026914	4-8'		12/6/00	N/A	
GP-37	3026915	8-10'		12/6/00	N/A	
GP-37	3026916	10-12'		12/6/00	N/A	
GP-38	3026917	0-2'	0-2.5"	12/6/00	0	0
GP-38		0-2'	7.5-9.75"	12/6/00	0	<1
GP-38		0-2'	17.75-19.75"	12/6/00	0	0
GP-38	3026918	2-4'	33-36"	12/6/00	0	0
GP-38	3026919	4-8'		12/6/00	N/A	
GP-39	3026920	0-2'	0-2.125"	12/6/00	5.2	1
GP-39		0-2'	6.75-9"	12/6/00	0.5	<1
GP-39		0-2'	15.875-18"	12/6/00	0.1	<1
GP-39	3026921	2-4'	33-36"	12/6/00	0.003	0
GP-39	3026922	4-6'		12/6/00	0	0
GP-39	3026923	6-8'		12/6/00	N/A	

TABLE 5: Summary of Soil Boring PLM Analytical Results
Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN

NOTES: Samples were analyzed by polarized light microscopy (PLM) modified method outlined in EPA/600/R-93/116
N/A - This section of the core was not analyzed.
1.0 - Samples with asbestos detected at 1.0% or greater.
fbg - Feet below grade
RJLG - R.J. Lee Group, Inc. Analytical Laboratory

Field Sample ID	RJLG Sample ID	Depth (fbg)	Sampled Section (in)	Date Collected	Asbestos Content (%)	Vermiculite Content (%)
GP-40	3026924	0-2'	0-2.125*	12/7/00	0	0
GP-40		0-2'	6.75-9"	12/7/00	0	0
GP-40		0-2'	15.875-18"	12/7/00	0	0
GP-40	3026925	2-4'	33-36"	12/7/00	0.051	2-3
GP-40	3026926	4-8'		12/7/00	0	0
GP-40	3026927	8-12'		12/7/00	N/A	
GP-41	3026928	0-2'	0-2.25"	12/7/00	0	0
GP-41		0-2'	6.875-9.125"	12/7/00	0.05	<1
GP-41		0-2'	15.875-18.25"	12/7/00	0	0
GP-41	3026929	2-4'	37-40"	12/7/00	0.92	1
GP-41	3026930	4-8'		12/7/00	0.3	0
GP-41	3026931	8-12'		12/7/00	N/A	
GP-42	3026932	0-2'	0-2.25"	12/7/00	0.001	<1
GP-42		0-2'	6.875-9.125"	12/7/00	0.027	1
GP-42		0-2'	15.875-18.25"	12/7/00	0	0
GP-42	3026933	2-4'	33-36"	12/7/00	0	0
GP-42	3026934	4-8'		12/7/00	N/A	
GP-43	3026935	0-2'	0-2.375"	12/7/00	0	0
GP-43		0-2'	7.125-9.5"	12/7/00	3.9	10
GP-43		0-2'	16.75-19"	12/7/00	0.2	<1
GP-43	3026936	2-4'	24-27"	12/7/00	0.038	3-5
GP-43	3026937	4-7'		12/7/00	0	0
GP-44	3026938	0-2'	0-2.125"	12/7/00	0	0
GP-44		0-2'	6.25-8.5"	12/7/00	1.4	10
GP-44		0-2'	15-17"	12/7/00	1.2	10
GP-44	3026939	2-4'	33-36"	12/7/00	0	0
GP-44	3026940	4-8'		12/7/00	N/A	
GP-44	3026941	8-10'		12/7/00	N/A	
GP-44	3026942	10-12'		12/7/00	N/A	
GP-45	3026938	0-4'	0-1.875"	12/7/00	0.8	10
GP-45		0-4'	5.25-7"	12/7/00	0	0
GP-45		0-4'	15.125-14.125	12/7/00	0	0
GP-45	3026944	4-8'		12/7/00	N/A	
GP-46	3026945	0-2'	0-1.875"	12/7/00	0	0
GP-46		0-2'	5.75-7.5"	12/7/00	1.5	2
GP-46		0-2'	13-15"	12/7/00	0.06	<1
GP-46	3026946	2-4'	24-27"	12/7/00	0	1
GP-46	3026947	4-8'		12/7/00	N/A	
GP-47	3026948	0-2'	0-1.75"	12/7/00	0.1	<1
GP-47		0-2'	5-6.5"	12/7/00	0.7	1
GP-47		0-2'	11.25-13.25"	12/7/00	1.1	4
GP-47	3026949	2-4'	33-36"	12/7/00	0	0
GP-47	3026950	4-6'		12/7/00	N/A	
GP-47	3026951	6-8'		12/7/00	N/A	
GP-48	3026952	0-4'	0-2.75"	12/7/00	0.07	<1
GP-48		0-4'	7.875-10.5"	12/7/00	0.02	<1
GP-48		0-4'	18.25-20.75"	12/7/00	0	<1
GP-48	3026953	4-6'		12/7/00	N/A	
GP-48	3026954	6-8'		12/7/00	N/A	

TABLE 6: Summary of Test Pit Soil PLM Analytical Results

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

Field Sample ID	RJLG Sample ID	Date Collected	Asbestos Content (%)	Mineral Identification	Sample Depth (fbg)	Comments
TP 1-1	3026985	12/7/00	2.3	Actinolite/ Tremolite	0-2	Vermiculite material in upper 1 foot
TP 1-2	3026986	12/7/00	0.0	No Asbestos form Detected	5-6	Fill material
TP 2-1	3026987	12/7/00	0.5	Actinolite/ Tremolite	2.5-3.0	Cinders and vermiculite
TP 2-2	3026988	12/7/00	1.4	Actinolite/ Tremolite	0-2	Sandy fill and vermiculite
TP 3-1	3026989	12/7/00	5.6	Actinolite/ Tremolite	0-1	Topsoil fill and vermiculite
TP 3-2	3026990	12/7/00	0.4	Actinolite/ Tremolite	2-3.5	Fill and vermiculite
TP 4-1	3026991	12/7/00	11.0	Actinolite/ Tremolite	0-1.5	Sandy fill, actinolite, and tremolite - south wall
TP 4-2	3026992	12/7/00	1.1	Actinolite/ Tremolite	2-2.5	Cinders and vermiculite - east wall
TP 5-1	3026993	12/7/00	5.5	Actinolite/ Tremolite	2.5-4.5	Actinolite and tremolite to 4.5'
TP 5-2	3026994	12/7/00	2.6	Actinolite/ Tremolite	4.5	Vermiculite with less actinolite and tremolite
TP 6-1	3026995	12/8/00	3.0	Actinolite/ Tremolite	0-0.5	Vermiculite with actinolite and tremolite - east wall
TP 6-2	3026996	12/8/00	3.7	Actinolite/ Tremolite	0-0.5	Vermiculite with actinolite and tremolite - north wall
TP 7-1	3026997	12/8/00	0.77	Actinolite/ Tremolite	1	Vermiculite and actinolite/tremolite
TP 7-2	3026998	12/8/00	3.7	Actinolite/ Tremolite	3-4	Vermiculite in pockets
TP 8-1	3026999	12/8/00	0.05	Actinolite/ Tremolite	2	North wall vermiculite layer
TP 8-2	3027000	12/8/00	5.6	Actinolite/ Tremolite	3	North wall vermiculite layer
TP 9-1	3027001	12/8/00	4.4	Actinolite/ Tremolite	0.5-1.0	North wall vermiculite layer
TP 9-2	3027002	12/8/00	0.03	Actinolite/ Tremolite	0.7	East wall vermiculite layer
TP 10-1	3027003	12/8/00	0.2	Actinolite/ Tremolite	2	Northwest wall 1" vermiculite layer
TP 10-2	3027004	12/8/00	0.2	Actinolite/ Tremolite	2	Southwest wall vermiculite layer

NOTES: Samples were analyzed with polarized light microscopy (PLM) modified method outlined in EPA/600/R-93/116

1.0 - Samples with asbestos detected at 1.0% or greater.

fbg - Feet below grade

**TABLE 7: Summary of Catch Basin Sediment Sample
PLM Analytical Analysis**

**Western Mineral Products Site
1719 Madison Street Northeast
Minneapolis, MN**

Field Sample ID	Date Sampled	Sample Type	Asbestos Content (%)	Mineral Identification
CB-1	12/11/00	Sediment	0.0	N/A
CB-2	12/11/00	Sediment	1.4	Actinolite/ Tremolite
CB-4	12/11/00	Sediment	0.0	Actinolite/ Tremolite

NOTES: The samples were analyzed using polarized light microscopy (PLM), following modified method outlined in EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials.

1.0 Samples with asbestos content of 1.0% or greater have been entered in boldface.

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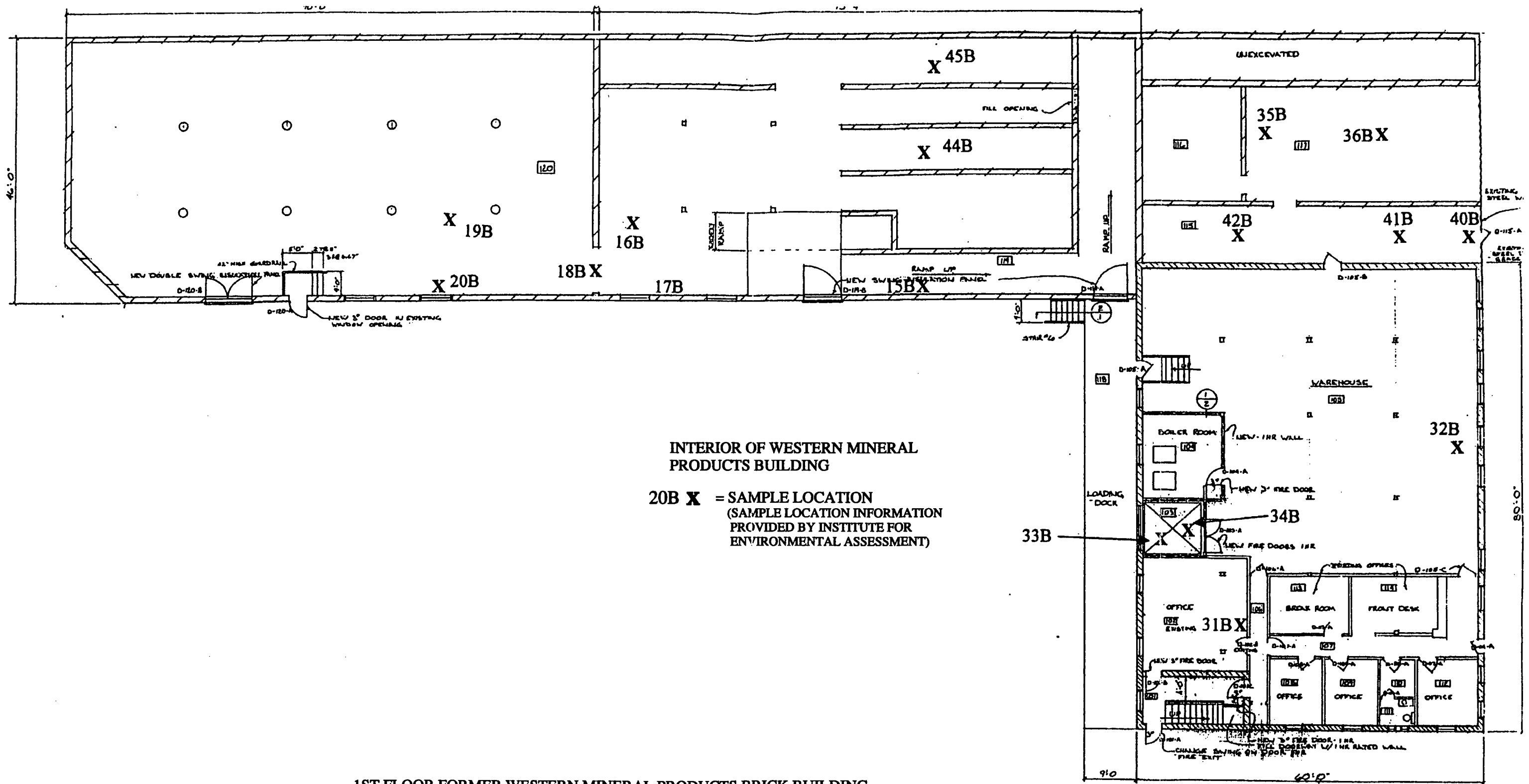
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Other:



NOT TO SCALE

REFERENCE DRAWINGS:
PANEL SPECIALTIES/MADISON
COMPLEX, DOUGLAS O'BRIEN
11/10/1989

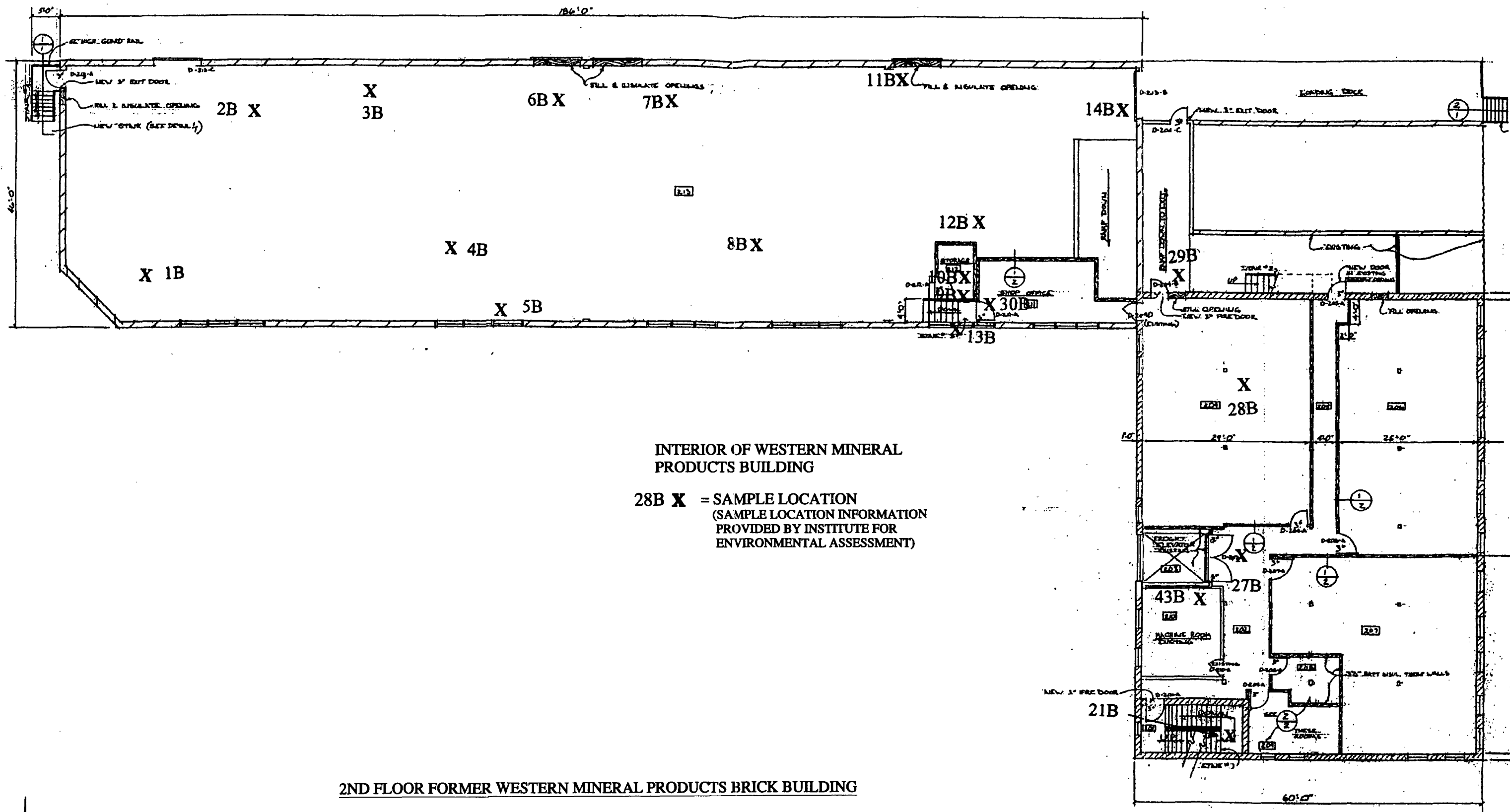
FIRST FLOOR PLAN.DWG

URS Corporation

Engineering & sciences applied to the earth & its environment

INTERIOR DUST SAMPLE LOCATIONS
WESTERN MINERAL PRODUCTS SITE
1720 MADISON ST. NE MINNEAPOLIS, MN

DRN BY: KAH	DATE: 01/01	PROJECT NO.	FIG. NO.
CHK'D BY: DML	DATE: 01/01	40633-468	4a



INTERIOR OF WESTERN MINERAL
PRODUCTS BUILDING

28B X = SAMPLE LOCATION
(SAMPLE LOCATION INFORMATION
PROVIDED BY INSTITUTE FOR
ENVIRONMENTAL ASSESSMENT)

2ND FLOOR FORMER WESTERN MINERAL PRODUCTS BRICK BUILDING

REFERENCE DRAWINGS:
PANEL SPECIALTIES/MADISON
COMPLEX, DOUGLAS O'BRIEN
11/10/1989

NOT TO SCALE

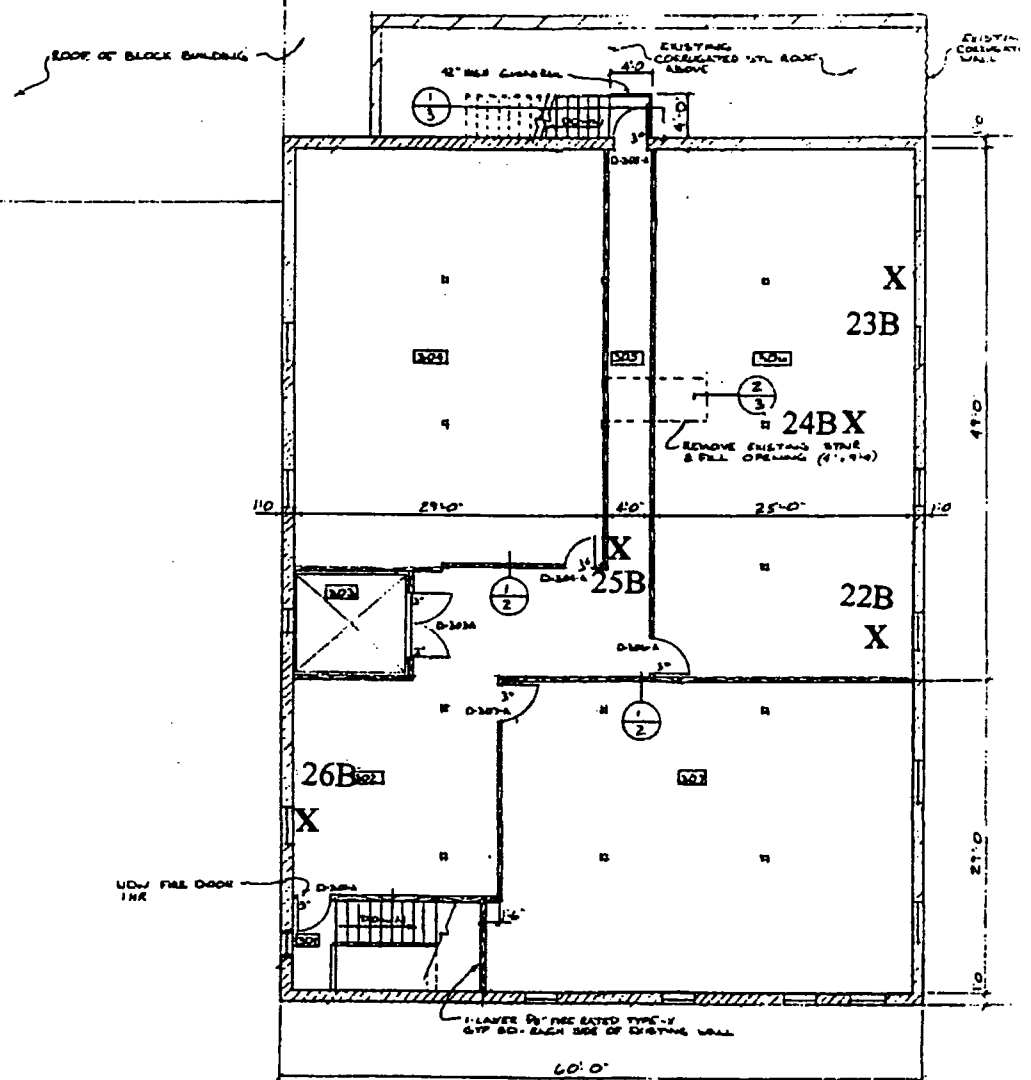
URS Corporation

Engineering & sciences applied to the earth & its environment

INTERIOR DUST SAMPLE LOCATIONS
WESTERN MINERAL PRODUCTS SITE
1720 MADISON ST. NE MINNEAPOLIS, MN

DRN BY: KAH	DATE: 01/01	PROJECT NO.	FIG. NO.
CHK'D BY: DML	DATE: 01/01	40633-468	4b

SECOND FLOOR PLAN.DWG



3RD FLOOR FORMER WESTERN MINERAL PRODUCTS BRICK BUILDING

INTERIOR OF WESTERN MINERAL
PRODUCTS BUILDING

22B X = SAMPLE LOCATION
(SAMPLE LOCATION INFORMATION
PROVIDED BY INSTITUTE FOR
ENVIRONMENTAL ASSESSMENT)

NOT TO SCALE

REFERENCE DRAWINGS:

PANEL SPECIALTIES/MADISON
COMPLEX, DOUGLAS O'BRIEN
11/10/1989

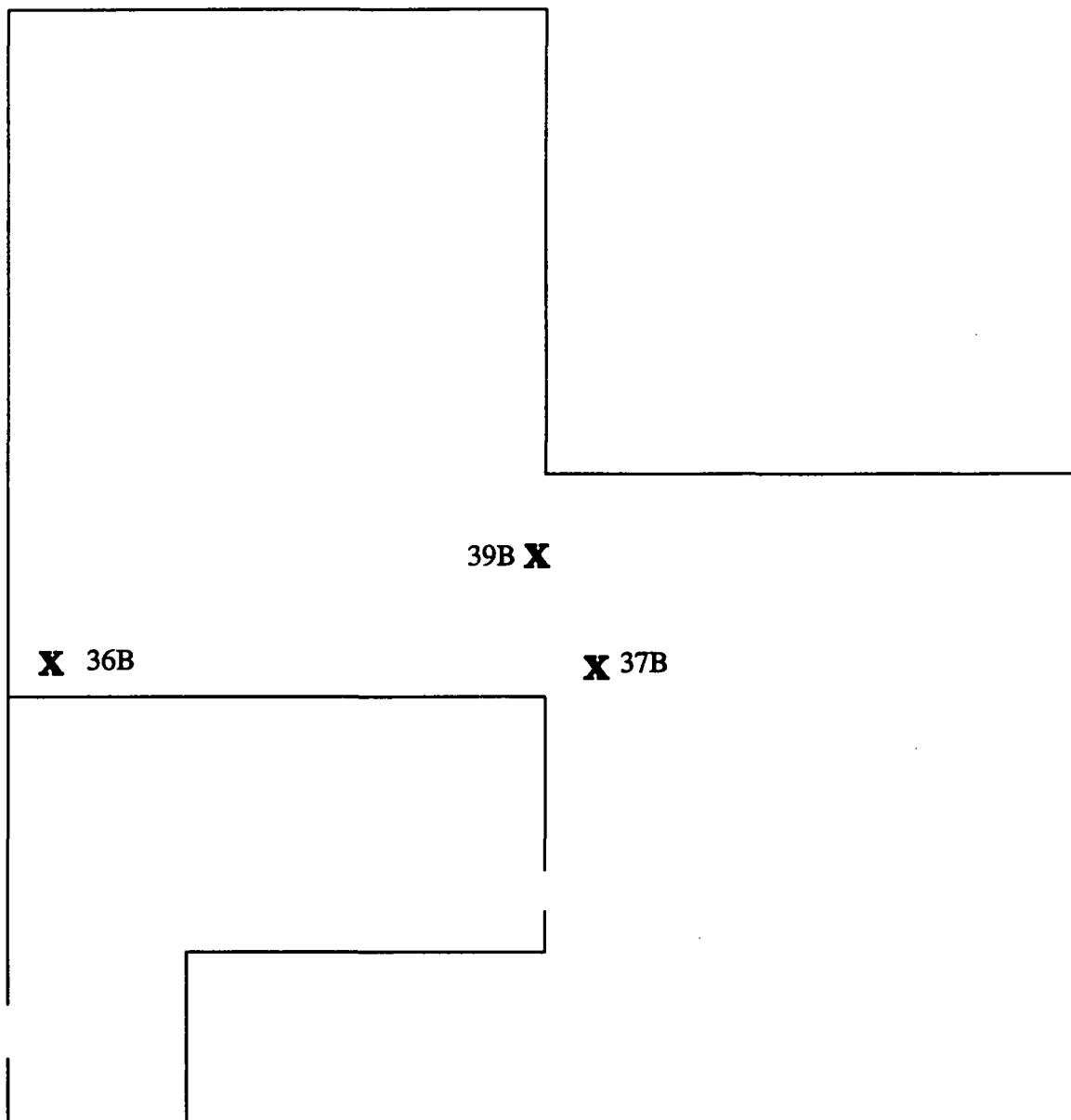
THIRD FLOOR PLAN.DWG

URS Corporation

Engineering & sciences applied to the earth & its environment

INTERIOR DUST SAMPLE LOCATIONS
WESTERN MINERAL PRODUCTS SITE
1720 MADISON ST. NE MINNEAPOLIS, MN

DRN BY: KAH	DATE: 01/01	PROJECT NO.	FIG. NO.
CHK'D BY: DML	DATE: 01/01	40633-468	4c



PARADISE AUTO BODY

INTERIOR OF PARADISE AUTO BODY,
FORMERLY WESTERN MINERAL PRODUCTS BUILDING

NOT TO SCALE

36B X = SAMPLE LOCATION
(SAMPLE LOCATION INFORMATION
PROVIDED BY INSTITUTE FOR
ENVIRONMENTAL ASSESSMENT)

PARADISE AUTO.DWG

URS Corporation Engineering & sciences applied to the earth & its environment			
INTERIOR DUST SAMPLE LOCATIONS WESTERN MINERAL PRODUCTS SITE 1719 MADISON ST. NE MINNEAPOLIS, MN			
DRN BY:	KAH	DATE:	01/01
CHK'D BY:	DML	DATE:	01/01
		PROJECT NO.	FIG. NO.
		40633-468	4d

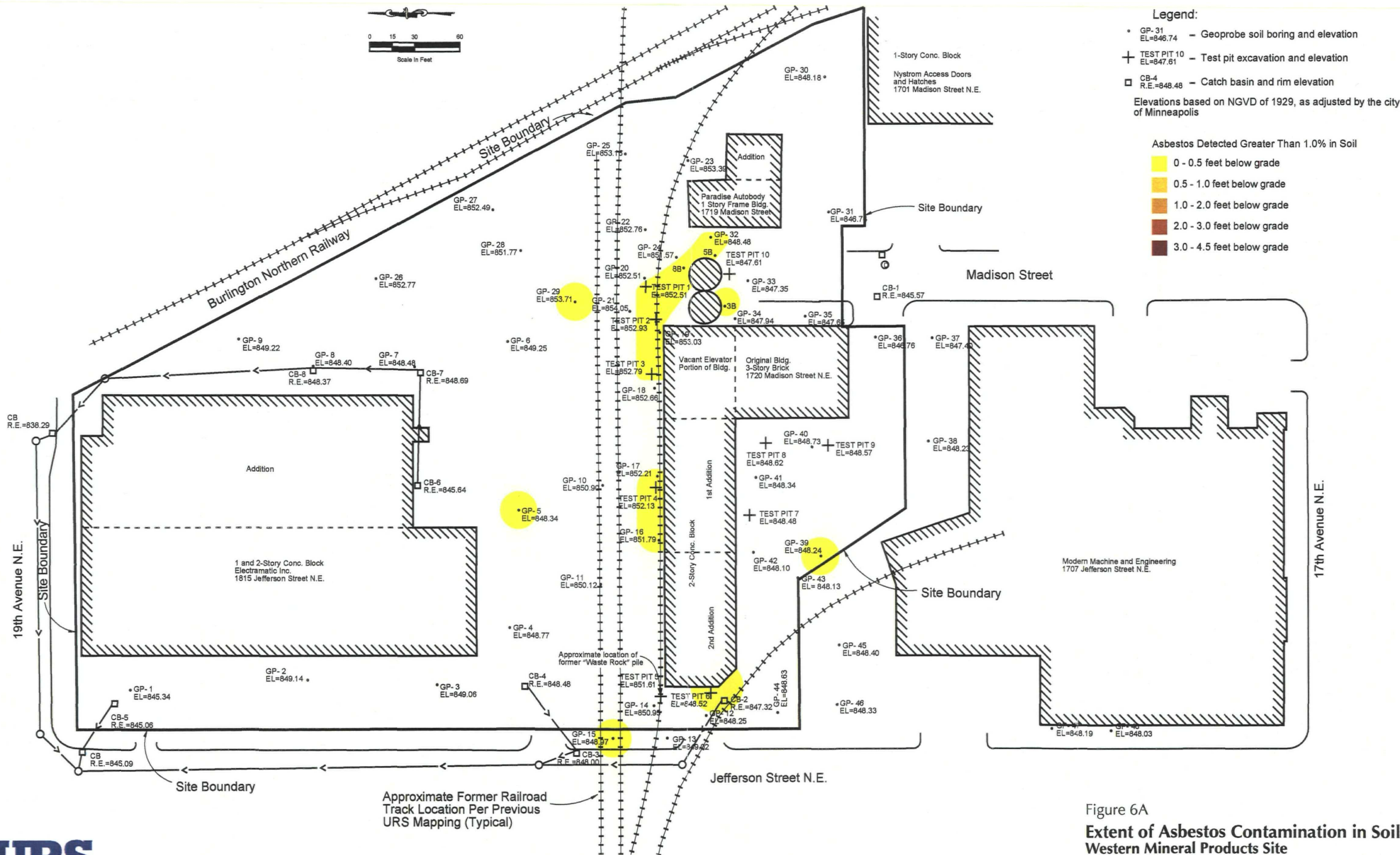


Figure 6A
Extent of Asbestos Contamination in Soil
 Western Mineral Products Site
 1719-1720 Madison Street NE
 Minneapolis, Minnesota
 January 2001 Project # 40633-468

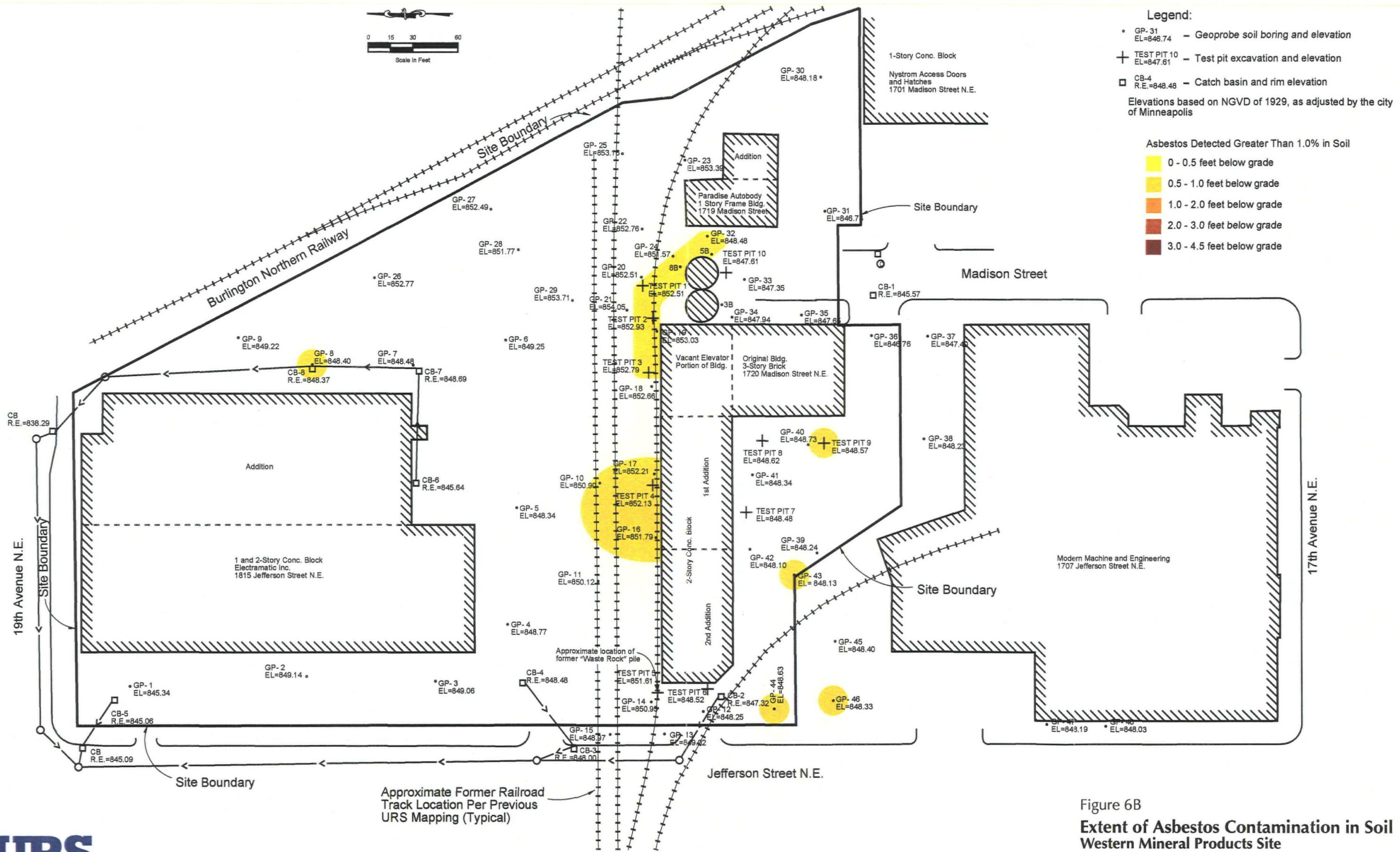


Figure 6B
Extent of Asbestos Contamination in Soil
Western Mineral Products Site
1719-1720 Madison Street NE
Minneapolis, Minnesota
January 2001 Project # 40633-468

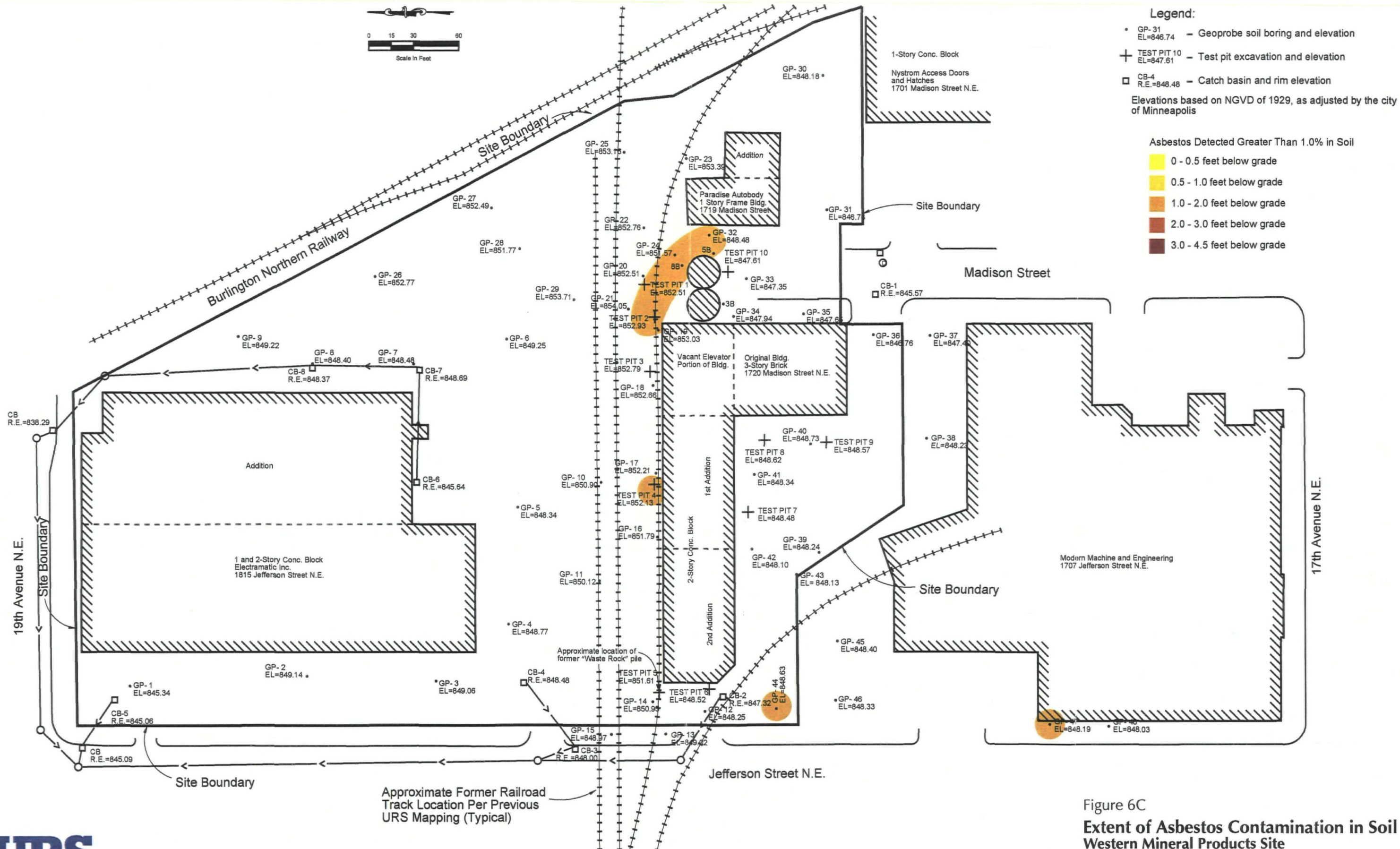


Figure 6C
Extent of Asbestos Contamination in Soil
 Western Mineral Products Site
 1719-1720 Madison Street NE
 Minneapolis, Minnesota
 January 2001 Project # 40633-468

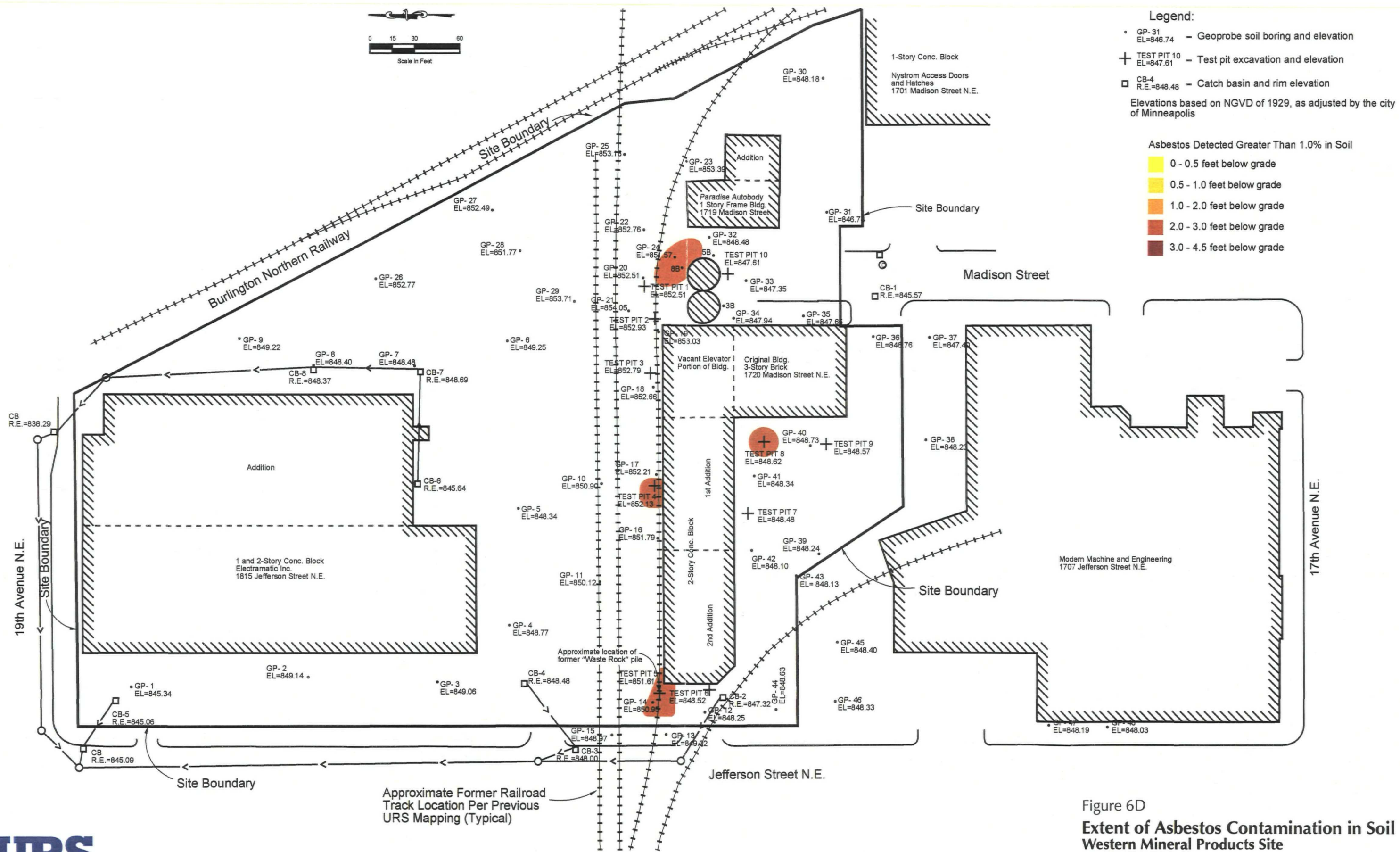


Figure 6D
Extent of Asbestos Contamination in Soil
Western Mineral Products Site
1719-1720 Madison Street NE
Minneapolis, Minnesota
January 2001 Project # 40633-468

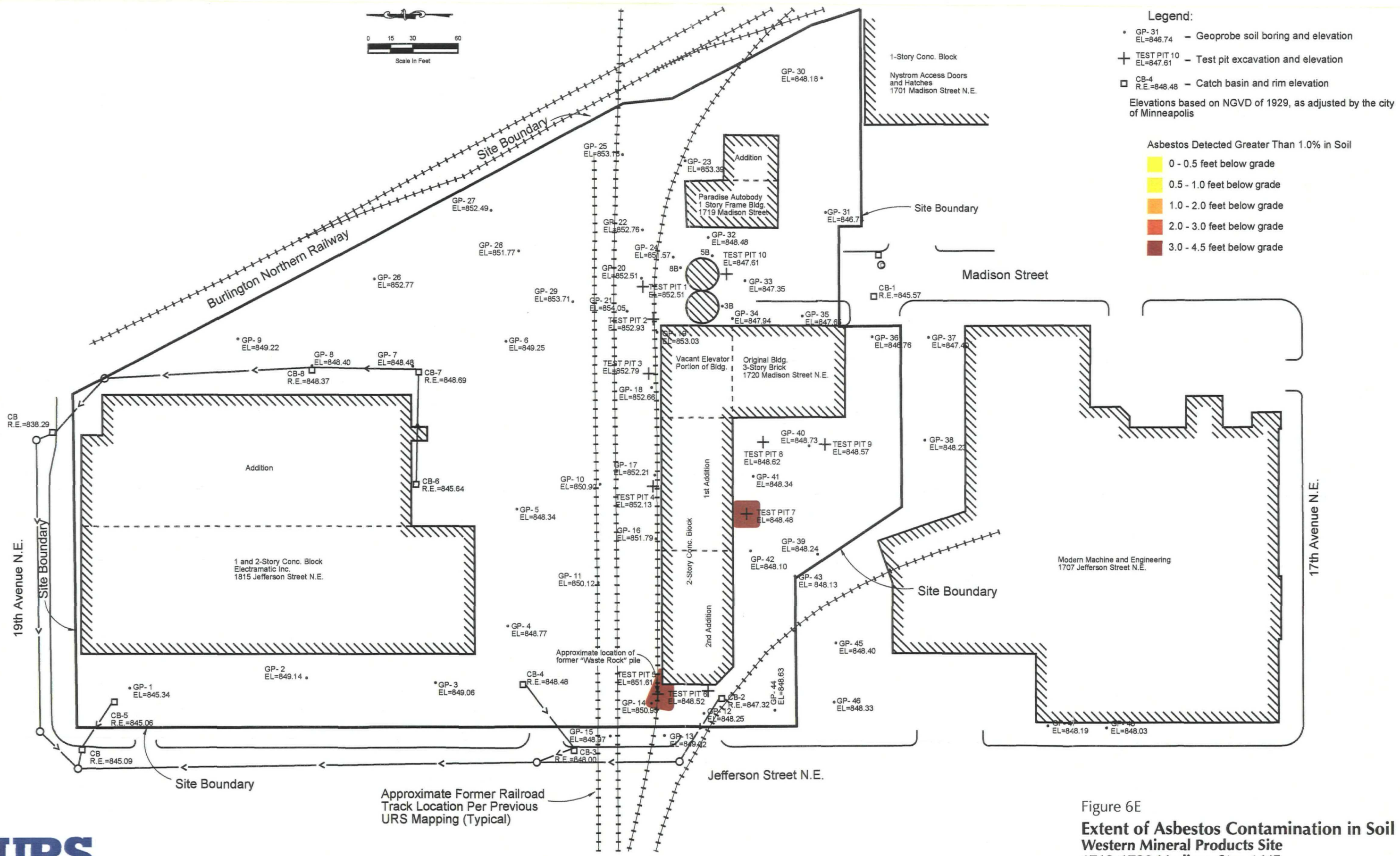


Figure 6E
Extent of Asbestos Contamination in Soil
Western Mineral Products Site
1719-1720 Madison Street NE
Minneapolis, Minnesota
 January 2001 Project # 40633-468



GRACE

David M. Cleary
Senior Environmental Counsel

W. R. Grace & Co.
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Memphis, TN 38119

Voice: (561) 362-2825
Fax: (901) 820-2059
email: david.cleary@grace.com

January 30, 2001

VIA E-MAIL

MPCA
520 Lafayette Road North
St. Paul, MN 55155-4194

ATTN: Mr. Jeff T. Connell, Compliance Coordinator

Re: Western Minerals Products Site

Dear Mr. Connell:


Enclosed please find W. R. Grace & Co.'s responses to MPCA's "Comments on Phase I Report" and "Conditions for Approval of Phase II Investigation Work Plan".

Our responses to the "Comments on Phase I Report" are made to the best of Grace's knowledge, given the limited time to investigate and respond to MPCA's comments, and having relied solely on documents or other information in Grace's possession and control.

Grace has responded to MPCA's questions in a given a fair interpretation of the meaning of the comments. Grace reserves the right to amend its responses based on any modification of the meaning of the comments, or upon the discovery of new information with would supplement or change any of our responses presented to you herein.

We look forward to continuing our cooperative relationship with the MPCA as we proceed with the investigation of this site.

Sincerely,

David M. Cleary 

David M. Cleary

Enclosures

cc : William M. Corcoran
Jay Hughes, Esq.
Richard Finke, Esq.
Robert R. Marnam
J. David Tucker
Kenneth Lurid, Esq.

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Tables

Table 1 Shipments of Vermiculite Concentrate to Western Mineral Products/W.R.
Grace & Co., Minneapolis, MN

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Appendix A Production Manufacturing Procedures

Appendix B Aerial Photographs

Appendix C Historic Topographical Maps

1.1 HISTORIC SOLID WASTE MANAGEMENT

Processing of the incoming vermiculite concentrate resulted in the generation of a byproduct known as "stoner rock." This byproduct was wheelbarrowed from the production areas to the west side of the 1958 plant addition between 1958 and 1967. Sometime during this period, a stockpile of the stoner rock existed. The size of the pile was unknown. We estimate that approximately 5% of the vermiculite concentrate processed resulted in generation of this material. The material in the pile was apparently used by various entities, which include Burlington Northern Railroad for traction at the railroad switches, Murphy Trucking for traction in their truck yard, and local residents for their personal use. In limited instances, the stoner rock may also have been bagged and sold.

From approximately 1967 until 1989 when the expanding plant ceased operation, the stoner rock was collected in the baghouse area, bagged, and shipped to landfills for disposal.

URS attempted to obtain additional information regarding the furnace room, past site conditions and work that certain contractors conducted for Western Mineral Products prior to 1989. The contractors searched and/or interviewed are described below:

Madison Silo Company
6131 Judd Road
Oriskany, New York 13424
315-736-0125

Contacts: Sherry and Willard Stave

All Madison Silo businesses were franchises and have long since been closed or dissolved. No records were available.

Nelson Trucking could not be located and are most likely out of business. URS contacted two trucking firms in Minnesota that have Nelson in their company name.

Brad Nelson Trucking
Aitkin, Minnesota
218-927-7059

Contact: Maureen Nelson

Cargo hauler, no dump or solid waste hauling.

Nelson Inc.
Deerwood, Minnesota
218-534-3521

Contact: Tony Nelson

Cargo hauler.

Olson & Sons General Contractors
5010 Hillsboro Avenue North
New Hope, Minnesota 55428
612-535-1481

- ♦ Mr. Olson stated that they do concrete work and most likely did construct some of the foundations and concrete block buildings. However, they have no records and all employees that were employed during the 1950s when the work was conducted have long since retired. He began work with the Olson Company in the late 1960s and had no recollection of doing work for Western Mineral Products or W. R. Grace.

BFI

2495 East 117th Street

Inver Grove Heights, Minnesota 55077

651-450-2157

Contacts: Tim Ralston, Ed Hartman, Jon Penheiter, Mike Ayers

Mr. Ralston checked with the managers and coordinators listed above to inquire about any records or information that they may have. Mr. Ralston indicated that landfill records have been archived by date. Mr. Ralston did not have knowledge of information pertaining to the subject waste stream. BFI operated the now closed Woodlake Sanitary Landfill, the Flying Cloud Sanitary Landfill, and the currently active Pine Bend Sanitary Landfill, all located in the metropolitan area.

2.1 VERMICULITE CONCENTRATE

Vermiculite concentrate shipments were always made on railroads from the mines to the vermiculite expanding plants. At least as far back as the early 1960s, bottom drop closed rail hopper cars were primarily used for the hauling of this concentrate. Depositions by former long-term employees revealed a general vagueness regarding railcar shipments prior to the 1960s with some recollection, either through their own experience or hearsay, that closed boxcars were once used for this purpose. The time line of the transition from boxcars to hopper cars is unknown. In at least one instance an employee recalled hearing about a power scoop being used to remove vermiculite concentrate from a railroad boxcar. The concentrate was dragged from the car, dropped through the open doors of the boxcar down to the receiving screw conveyor, and then to a vertical bucket elevator which carried the concentrate to overhead bin storage. Shipment information for vermiculite concentrate to the Minneapolis, MN facility has been developed for the years 1964-1988. A summary has been developed and is presented as **Table 1**.

2.2 ASBESTOS

The list of raw materials used at the Minneapolis, MN vermiculite expansion plant and provided on July 14, 2000, did not indicate the use of commercial grade chrysotile asbestos because the list had been prepared in 1987, long after commercial asbestos at this site was no longer used. During the time commercial grade chrysotile asbestos was used (i.e., prior to 1972), shipments of this ingredient were made in rail boxcars. According to employee depositions, chrysotile asbestos was either packaged loose in 100# paper bags or in 100# compressed blocks. Railcar shipments were generally received on a monthly basis. The employees recalled that the principal suppliers were Johns-Manville and Carey-Canada. Formula sheets for products containing commercial grade chrysotile asbestos generally included a list of acceptable asbestos vendors but it is unknown whether other commercial asbestos suppliers actually shipped material to this site.

2.3 PRODUCTS MANUFACTURED

On July 14, 2000, W. R. Grace & Co. provided certain information to the Minnesota Pollution Control Agency at the request of Mr. Jeff T. Connell, Compliance Coordinator. The information was forwarded to Mr. Connell in a transmittal entitled *Grace Responses to Minnesota Pollution Control Agency Questions (07/14/00)*. Detailed lists of products manufactured at this site and the ingredients used were part of the above document (Section 15). A copy of this particular section, Production Manufacturing Procedures, is presented as **Appendix A**. Formula sheets had been prepared for each of the products manufactured at the site and the required ingredients by weight and/or volume were specified.

3.1 RAILROAD TRACKS AND SPURS REMOVAL HISTORY

According to Mr. John Hovland, Division Engineer with BNSF (letter December 28, 2000), railroad tracks on 18th Avenue between Jefferson Street and Madison Street or the main railroad line running southeast to northwest on the east side of Madison Street, were removed in 1979-1980. Grading work consisted of leveling the ground following removal of the tracks.

According to Mr. Douglas O'Brien of Panel Specialties, the rail spur north of the Western Mineral Products building running east and curving south to connect into the main line running southeast to northwest was removed in the summer of 1989. Crews that conducted demolition work of plant equipment for W. R. Grace also conducted the removal of the spur. Grading work consisted of leveling the ground following removal of the spur track.

Aerial photographs from the years 1967 and 1974 were flown by Chicago Aerial Survey March April 1967, scale 1" = 100', and 1974 flown by Mark Hurd April 19, 1974, scale 1" = 100'. According to the photography, it appears that the rail spur crossing the Western Mineral Products site from the west going to the Northwest Casket Company dock was removed sometime between 1967 and 1974. Mr. Steve Lobek of Modern Machine LLC at 1707 Jefferson Street, spoke to Bernie and Dave, the owners at Northwest Casket Company. According to Bernie and Dave, the spur was removed sometime between 1965 and 1966 to accommodate an addition to the building in approximately 1967. It is unknown if any grading was conducted after removal.

Aerial photographs and historic topographical maps are presented as **Appendix B** and **Appendix C** respectively.

4.1 HISTORY

Western Mineral Products Company was organized in Omaha, Nebraska in 1928. By 1936 the company had expanded its scope of operations into Minnesota and rented/leased the second floor of the three-story brick building located at 1720 Madison Street, NE in Minneapolis, Minnesota from Northwestern Casket Company, the owner of the building. Also, in 1936, Western Mineral Products became a licensee of the Zonolite Company, a Montana Corporation. This allowed Western Mineral Products to construct and operate a vermiculite expansion furnace on the second floor of the above named building. Rail service to this property was constructed under a track agreement with the Northern Pacific Railroad Company in May 1937 (Track Lease #18432). Western Mineral Products, more than likely, expanded vermiculite at this site starting in the 1936-37 time period.

In the 1940's Zonolite Company acquired stock in Western Mineral Products, and by the time of the purchase of the Zonolite Company by Grace in April 1963, Zonolite owned 104,000 shares of the total 315,800 shares issued or held by Western Mineral Products.

The building lease arrangement with Northwestern Casket continued until the building and property was purchased by Western Mineral Products in August 1954 (Hennepin County Deed Book #2028 Page 636). During this lease hold period (i.e. 1936-1954) several additions were made to the original three-story brick building which had been constructed in 1903. These additions were obviously made by Western Mineral Products as their business requirements expanded. The first addition was made in 1946 and was described on the summary sheet Description of Buildings and Grounds – January 1, 1963 (prepared by Western Mineral Products) as a 34' X 58' addition to be used for a vermiculite furnace and vermiculite concentrate storage. This building addition was due north of the original brick building. In 1951 two outside concrete stave silos (each 20' diameter x 45' high) were erected and were used for vermiculite concentrate storage. These were constructed on a vacated portion of Madison Street NE and were positioned east of the 1946 building addition. Records show that this portion of Madison Street was vacated in 1925 and the updated legal description of the property included a portion of this vacated street.

A building and land (Lot 3 & 4 – Block 22) were purchased from Hart-Carter Company in December 1951 and the existing 30' X 60' building was remodeled and subsequently used as a laboratory by Western Mineral Products. This property is located on the eastern side of Madison Street, NE and is bounded on the far east by active railroad lines. Use of the building as a laboratory was discontinued after the merger of Grace and Western Mineral Products in 1966. The building was leased to Paradise Autobody. It was included in the property sale to Madison Complex, Inc. by Grace in 1989. It is understood that the property has been subsequently purchased by Paradise Autobody.

In 1954 a warehouse addition was made north and west of the original brick building and due west of the 1946 addition. This 46 ½' X 88' concrete block and concrete building was used as a bagging warehouse and for a perlite expanding furnace (installed in August 1954). In 1958, another warehouse addition was made and this 42 ½' X 90' concrete block/concrete structure was attached to the west side of the 1954 warehouse addition. These warehouse buildings

encroached 8' onto 18th Ave. NE. In March 1958, Western Mineral Products petitioned the Minneapolis City Planning Commission for the vacation of the impacted part of 18th Ave. NE and approval was granted thereafter. These were the vermiculite expansion plant buildings acquired by W. R. Grace & Co. in the merger with Western Mineral Products Company on December 31, 1966 (see **Sketch 1** under the Figures tab for location and sizes). Grace continued to operate the vermiculite expansion facilities from the 1966 merger date until closure in 1989. After closure, all equipment was removed from the buildings and the property was sold to Madison Complex, Inc. in September 1989. The two concrete stave silos were included as part of this sale.

During one period of the operating ownership by Western Mineral Products, land now owned by Electramatic, Inc.. and Arnold Gilbertson (now DBA as Electramatic at 1815 Jefferson St., NE) was either owned or leased by Western Mineral Products/Grace. A roof tile manufacturing plant was constructed by Western Mineral Products in 1955 on property leased from the Northern Pacific Railroad Company (15,000 sq. ft.) and Great Northern Railroad Company (51,000 sq. ft.). According to the existing records, these tiles were made with perlite and not vermiculite.

In 1960 land adjacent to these railroad leases was acquired by Western Mineral Products from Clara A. Stark (two parcels totaling 36,437 sq. ft.). The former railroad leased land and the property purchased from Ms. Stark constitute the current land holdings of Electramatic, Inc. and/or Arnold Gilbertson with a single business address of 1815 Jefferson St. NE., Minneapolis, MN, 35418. The property purchased from Ms. Stark was sold by W. R. Grace & Co. to Atomic Properties, Inc. on March 28, 1969. The railroad land leases (2) in effect at that time were also transferred to Atomic Properties, Inc. Subsequent ownership and or use of the property from the time of Grace involvement until the purchase by Electramatic, Inc./Arnold Gilbertson is unknown.

TABLES

Table 1

Shipments of Vermiculite Concentrate to
Western Mineral Products/W. R. Grace & Co.
Minneapolis, MN

<u>Year</u>	<u>Tons of Vermiculite Concentrate Shipped</u>
1964	5660
1965	5025
1966	5232
1967	5059
1968	5021
1969	4708
1970	5818
1971	4295
1972	3248
1973	4947
1974	4121
1975	3566
1976	4136
1977	4834
1978	3140
1979	3888
1980	3153
1981	2947
1982	2667
1983	3241
1984	1706
1985	2318
1986	1836
1987	1840
1988	675
1989	Plant Closure

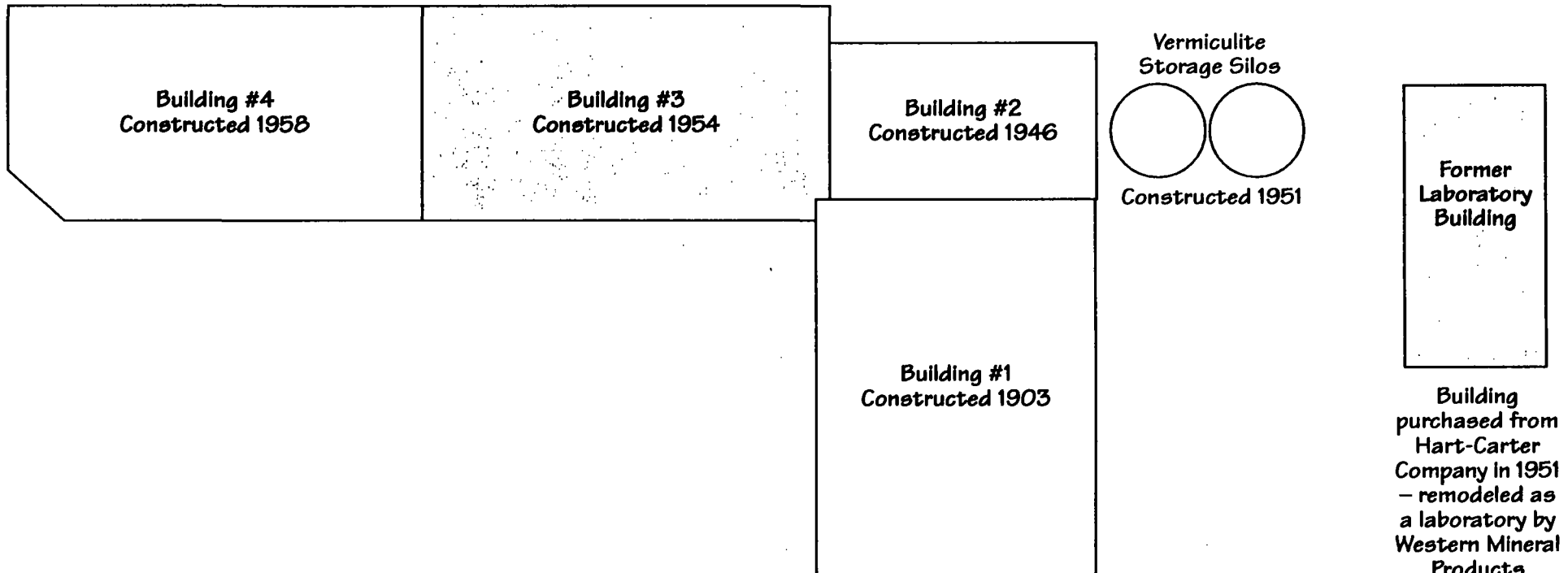
Source: W. R. Grace response letter of August 28, 2000 from K. W. Lund, Esq. (Holme Roberts & Owens) to Ms. Carol Ropski – EPA Region 5 (Chicago, IL) in response to 104(E) request.

Note: Shipment records prior to 1964 included multiple Western Mineral Products expanding plants, which could not be broken out by location.

RRM:jm
01/17/01

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FIGURES



URS

**Proximate Location and Size
Western Mineral Products Property
1719-1720 Madison Street NE
Minneapolis, Minnesota
January 8, 2000** Sketch 1

PRODUCTION MANUFACTURING PROCEDURES

MINNEAPOLIS PLANT

I N D E X

PRODUCTION MANUFACTURING PROCEDURES

Section "A"	-	Vermiculite
Section "B"	-	Perlite
Section "C"	-	Other Products
Section "D"	-	Misc. Procedures
Section "E"	-	Personnel Procedures

SECTION "A" - VERMICULITE

A-1	Sani-Flor
A-2	Insulation
A-3	Refrigeration
A-4	Concrete Aggregate #4
A-4A	Concrete Aggregate #3
A-5	Plaster Aggregate
A-6	Plaster Finish Aggregate
A-7	San-A-Pan
A-8	#0 Expanded for Bar-B-Sorb
A-9	Z-Crete
A-10	BTU (Not Coated) (See C-17 for Coated)
A-11	Terra-Lite
A-12	Terra-Lawn
A-13	Terra-Lite Fertilizer Conditioner
A-14	Swift & Company Agricultural #4
A-15	Attic Insulation
A-16	African #3
A-17	Fire-Trol Aggregate
A-18	
A-19	Micaceous Filler KW-1 (-12 Mesh Fines)
A-20	Industrial Product and Ore Code Sheet

Procedure A-1

Revised May 6, 1964

Outdates December 20, 1962

ORE: Libby #0

PRODUCT: SANI-FLOR

This product will be straight run #0 vermiculite at controlled density, passed over the gravity screen (see D-2 screen assemblies) to remove finer sizes. Underside screenings may be blended into #1 Expanded providing -12 mesh is removed during run. (See Note)

NOTE: Do not blend into #1 runs unless -12 mesh is being removed.

Bag Content: 4.17 cu. ft.
Bag Weight Limits: 23-28 lbs.
Bag Weight Goal: 25 lbs.
Rock Content: Remove all possible

PLANT STANDARDS

U. S. Screen	3/8M	4	8	16	50	Pan
Cumulative % by Volume	45-65	90-99	95-100			

PRODUCTION DEPARTMENT

Max F. Corso

MFC:mr

Procedure A-2

Revised May 6, 1964

Outdates December 20, 1962

ORE: Libby #1

PRODUCT: INSULATING FILL

This product will be straight run #1 vermiculite with
-12 mesh and airborne fines removed from all production
runs.

Bag Content: 4.17 cu. ft.

Bag Weight Limits: 18-24 lbs.

Bag Weight Goal: 18 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U. S. Screen	3/8M	4	6	16	50	Pan
Cumulative % by Volume	0-10	45-70	90-99	98-100		

PRODUCTION DEPARTMENT

Max F. Corso

MFC:mr

Procedure A-3
Revised November 25, 1962
Outdates April 12, 1961

ORE: Libby #2

VAC: 75 to 80 unless otherwise specified

PRODUCT: REFRIGERATION SIZE

This product will be straight run #2
Vermiculite over scalping screen (see
D-2 screen assemblies) with airborne
fines removed from all production
runs.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 18-24 pounds

Bag Weight Goal: 18 pounds

Rock Content: Remove all possible

NOTE: POSITIVELY NO 3/8 MATERIAL IN THIS EXPANDED
PRODUCT FOR USE MIXED PRODUCTS.

PLANT STANDARDS

U.S. Screen	4	8	16	30	50	100
Cumulative % by volume	0-10	50-90	90-100	98-100		

PRODUCTION DEPARTMENT
Max F. Corso

C O N F I D E N T I A L

Procedure A-4

ORE: Libby #4
VAC: 75 to 80 unless otherwise specified

Revised November 12, 1965
Outdates October 7, 1965

PRODUCT: STABILIZED, PLAIN, OR ACCELERATED STABILIZED CONCRETE AGGREGATE #4

This product will be straight run #4 vermiculite over the scalping screen (A-3) to remove clinkers with airborne fines removed from all production runs.

1. Plain Concrete Aggregate will be produced without a stabilizing agent. Bag in appropriately marked plain 4 cu. ft. bags.
2. Stabilized Concrete Aggregate will be produced with a minimum of 3 oz., maximum 4 oz. stabilizing agent per 4 cu. ft. bag. Introduce stabilizing agent into each bag with automatic measuring device at hopper. Bag in printed stabilized concrete aggregate bag.
3. Accelerated Stabilized Concrete Aggregate shall be stabilized as indicated in step 2. Accelerator (AC-1) shall be by manual addition, adding one measured scoop (4 pounds) to each 4 cu. ft. bag and vigorously stir into the top portion of the bag. Each plant will provide its own scoop.

All bags containing Accelerator AC-1 shall be identified by the letters "AC" in marking crayon.

4. Billing Information. Make sure all shipping papers covering Zonolite Concrete Aggregate clearly indicates whether the material is plain or stabilized and whether or not it contains AC-1.

NOTE: Stabilizing Agent - Vinsol NVX, Hercules Powder Company

Accelerator AC-1 - Aluminum Sulfate, Std. Grind - Allied Chemical - General Chemical Division

CAUTION: The identification and source of supply of AC-1 must be protected by agreement with Zonolite Company, therefore, under no circumstances will any information be given without written permission of Mr. C. A. Pratt. Scoop should be carefully calibrated to deliver exactly 4.0 pounds of AC-1.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 24-40 lbs.*

Bag Weight Goal: 32 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	8	16	30	50	100	
Cumulative % by Weight *	0	0-5	15-65	60-98	90-100	

* V.I. Specifications Type 2, 8/14/64

Production Department

Revised October 7, 1965

Outdates April 15, 1965

ORE: Libby P.A. #3 (To be furnished only on special order requiring #3)

VAC: 75 to 80 unless otherwise specified

PRODUCT: STABILIZED OR PLAIN CONCRETE AGGREGATE

This product will be straight run #3 vermiculite over the scalping screen (see D-2 screen assemblies) with airborne fines removed from all production runs.

1. PLAIN CONCRETE AGGREGATE will be produced without a stabilizing agent and put into appropriately marked plain 4 cu. ft. bags.
2. STABILIZED CONCRETE AGGREGATE will be produced with a minimum of 5 oz., maximum 6 oz. of stabilizing agent per 4 cu. ft. bag. The stabilizing agent to be introduced into each bag with the automatic measuring device at the bagging hopper. Bag in printed stabilized concrete aggregate bags.
3. BAG MARKING Identify neatly each concrete aggregate bag containing #3 size material with a large black #3 in a conspicuous location on the bag.

NOTE: Vinsol NVX, Hercules Powder Company

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 24-40 lbs.*

Bag Weight Goal: 24 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U. S. Screen	4	8	16	30	50	100	Pan
Cumulative % by Weight **	0-2	0-40	15-60	55-95	80-98	90-100	

* NOTE: This extreme is permitted by ASTM specifications and is not to be exceeded. Always get lightest weight possible.

** ASTM Specification C332-61

Production Department

D. P. Wesenberg

DPW/mr

Procedure A-5

Revised December 20, 1962

Outdates September 1, 1960

ORE: Libby #3

VAC: 75 to 80 unless otherwise specified

PRODUCT: PLASTER AGGREGATE

This product will be straight run #3 Vermiculite ore
over scalping screen (See D-2 screen assemblies) with
airborne fines removed from all production runs.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 24-36 lbs.

Bag Weight Goal: 24 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	8	16	30	50	100
Cumulative % By Weight *	0-10		60-90	75-98	90-100

* Underwriters' Lab Specifications by weight.

PRODUCTION DEPARTMENT
Max F. Corse

Procedure A-6

Revised December 20, 1962

Outdates September 1, 1960

ORE: Libby #4

VAC: 75 to 80 unless otherwise specified

PRODUCT: PLASTER FINISH AGGREGATE

This product will be straight run #4 Vermiculite ore over scalping screen (see D-2 screen assemblies) with airborne fines removed from all production runs. Bag in plain bags appropriately identified.

Bag Content: 2.1 cu. ft.

Bag Weight Limits: 16-20 lbs.

Bag Weight Goal: 16 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	8	16	30	50	100	Pan
Cumulative % By Volume	0	0-2	45-65	85-95	95-100	

PRODUCTION DEPARTMENT
Max F. Corso

Procedure A-7
September 1, 1960

ORE: Screened Product

SCREEN: -7 Mesh from #0 or #1

PRODUCT: SAN-A-PAN

This product may be screened from production runs of #0 ore or #1 ore providing specifications are met. Bag in plain 4 cu.ft. bags appropriately identified.

Bag Content: 4.1 cu. ft.
Bag Weight Limits: 30 - 50 lbs.
Bag Weight Goal: 30 lbs.

PLANT STANDARDS

U.S. Screen	3/8	4	8	16	30	50	100	Pan
Cumulative % By Volume		0	0-10	35-65	60-90	75-95	90-100	

PRODUCTION DEPARTMENT

Max F. Corso

MFC:so

Procedure A-8

October 1, 1964

Outdates September 1, 1960

ORE: Libby #0

PRODUCT: #0 EXPANDED (for BAR-B-SORB)

This product will be straight run #0 vermiculite passed over a 3/8M screen to remove objectionable undersize. Material passing through 3/8 mesh may be blended back into Insulating Fill only when screening -12 mesh fines size from Insulating Fill run. Do not blend minus 3/8 mesh back into Insulating Fill unless above screening precautions are taken. Bag in plain 4 cu. ft. bags appropriately marked. (Open bags may be filled for in-plant use.)

Bag Content: 4.17 cu. ft.

Bag Weight Limits: 18 - 24 lbs.

Bag Weight Goal: 18 lbs.

PLANT STANDARDS

U.S. Screen	3/8M	4	8
Cumulative % By Volume	50-90	90-100	0-10

PRODUCTION DEPARTMENT

Max F. Conso

MFC/mr

Procedure A-9

Revised December 20, 1962

Outdates September 1, 1960

ORE: Libby #3

VAC: 75 to 80 unless otherwise specified

PRODUCT: Z-CRETE

This product will be straight run #3 Vermiculite ore over scalping screen (same as Plaster Aggregate) with airborne fines removed. Bag in Z-Crete bag or C. T. C. bag with appropriate square checked.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 24 - 36 lbs.

Bag Weight Goal: 24 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	4	8	16	30	50	100
Cumulative % by Volume	0	0-10	55-75	75-98	90-99	95-100

PRODUCTION DEPARTMENT
Max F. Corso

Procedure A-10
Revised December 20, 1962
Outdates September 1, 1960

ORE: Libby #4
VAC: 75 to 80 unless otherwise specified.

PRODUCT: B. T. U. NOT COATED

This product will be straight run #4 Vermiculite ore over scalping screen (same as Plaster Finish Aggregate) with airborne fines removed from all production. Bag in C. T. C. bags with appropriate square checked, or in appropriately identified plain 4 cu. ft. bag.

Bag Content: 4.1 cu. ft.
Bag Weight Limits: 32-40 lbs.
Bag Weight Goal: 32 lbs.
Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	8	16	30	50	100	Pan
Cumulative % by Volume	0	0-2	45-65	85-95	95-100	

PRODUCTION DEPARTMENT
Max F. Corso

Procedure A-11
Revised May 7, 1963
Outdates November 23, 1962

ORE: Libby #2
VAC: 80 to 90 unless otherwise specified

PRODUCT: TERRA-LITE

This product will be straight run #2 Vermiculite
over scalping screen (same as Refrigeration) with
airborne fines removed from all production runs.
Bag in 3¹/₄ bushel (4 cu. ft.) Terra-Lite bags.

Bag Content: 4.1 cu. ft.
Bag Weight Limits: 18-24 pounds
Bag Weight Goal: 18 pounds
Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	4	8	16	30	50	100	Pan
Cumulative % by volume	0-10	50-90	90-100	98-100			

PRODUCTION DEPARTMENT
Max F. Corso

Procedure A-12

Revised May 7, 1963

Outdated December 20, 1962

ORE: Libby #4

VAC: 80 to 90 unless otherwise specified

PRODUCT: TERRA-LAWN

This product will be straight run #4 Vermiculite ore over scalping screen (same as Plaster Finish Aggregate) with airborne fines removed from all production. Bag in appropriately identified plain 4 cu. ft. bags.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 32-40 lbs.

Bag Weight Goal: 32 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	8	16	30	50	100	Pan
Cumulative % by Volume	0	0-2	45-65	85-95	95-100	

PRODUCTION DEPARTMENT
Max F. Corso

ORE: Libby #3

VAC: 80 to 90 unless otherwise specified

PRODUCT: TERRA-LITE FERTILIZER CONDITIONER*

This product will be straight run #3 Vermiculite ore
(see footnote exception) over scalping screen (same as
Plaster Aggregate) with airborne fines removed from all
production runs.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 24-40 lbs.

Bag Weight Goal: 24 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	4	8	16	30	50	100
Cumulative % by Volume	0	0-10	50-80	75-99	85-99	95-100

*This product may be screened from #1 production, using 7 mesh gravity
screen providing specifications are met.

Procedure A-14

August 9, 1961

ORE: Libby #4

VAC: 70 to 80 unless otherwise specified

PRODUCT: SWIFT & COMPANY AGRICULTURAL #4

This product will be straight run #4 Vermiculite ore over scalping screen (see D-2 screen assemblies) with airborne fines and all possible stoner rock removed from all production runs.

Bag in plain bags appropriately identified as Swift #4.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 33-35 lbs.

Bag Weight Goal: 34 lbs.

Rock Content: Remove all possible

Special Note: Quality control factor - The bulk density of Agricultural Grade Expanded #4 Vermiculite (with cyclone fines and stoner rock removed) shall be 34 pounds plus or minus one pound per 4 cu. ft. bag. Bags weighing less than 33 lbs. or more than 35 lbs. shall not be shipped.

PLANT STANDARDS

U.S. Screen	3/8	4	8	16	30	50	100
Cumulative % By Volume	0	0	0	0-2	30-65	80-95	95-100

PRODUCTION DEPARTMENT

Max F. Corso

mfc:km

Revised October 7, 1965

Outdates May 7, 1963

ORE: Libby #2

VAC: 70 to 75 unless otherwise specified. (70 goal)

PRODUCT:

ATTIC INSULATION

This product will be straight run #2 Vermiculite over scalping screen (See D-2 Screen assemblies) with airborne and cyclone -12 fines removed from all production runs.

Bag in printed 3 cu. ft. Attic Insulation bags.

Bag Content: 3 cu. ft.

Bag Weight Limits: 15 to 18 pounds

Bag Weight Goal: 15 pounds

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	4	8	16	30	50	100	Pan
Cumulative % by Volume	0-10	50-90	90-100	98-100			

PRODUCTION DEPARTMENT
Max F. Corso

January 10, 1963

ORE: African #3

VAC: 75 - 80 Unless Otherwise Specified

AFRICAN #3 EXPANDED

This product will be straight run #3 African ore over scalping screen (A-3 to remove clinkers and objectionable large sizes) with airborn fines removed from all production runs.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 16-20 lbs.

Bag Weight Goal: 16 lbs.

Rock Content: Remove all possible

PLANT STANDARDS

U.S. Screen	4	8	16	30	-30
Cumulative % by Volume	0-3	60-80	90-100	98-100	0-2

PRODUCTION DEPARTMENT
Max F. Corso

*FIRE-TROL AGGREGATE
DENSITY CHECK*

File R3966 (Sp) Vol. I App. A Page 2 Issued: 5-7-63

CHEMICAL DEPARTMENT:

GENERAL

The following tests shall be conducted on samples received from the inspector.

UNIT WEIGHT

Samples

The sample shall be the 4 cu ft bag of vermiculite "FIRE-TROL" aggregate.

Apparatus

The apparatus shall consist of the following:

- (1) Scale - sensitive to 0.1 lb.
- (2) Tamping rod - made of 5/8 in. diameter straight steel, 24 in. long with one end tapered a distance of 1 in. to a blunt bullet-shaped point.
- (3) Measure - a 1 cu ft size accurately calibrated and preferably cylindrical in form.

Method

The measure shall be filled one-third full and the top leveled off with the fingers. The mass shall be rodded with the tamping rod with 25 strokes evenly distributed over the surface. The measure shall be filled two-thirds full and again rodded 25 strokes as before. The measure shall be then filled to overflowing, rodded 25 times, and the surplus material struck off, using the tamping rod as a straight edge.

In rodding the first layer, the rod shall not be forcibly permitted to strike the bottom of the measure. In rodding the second and final layers, only enough force shall be used to cause the rod to penetrate the last layer of the material placed in the measure.

The weight per cubic foot shall be the difference in weight of the empty and filled containers.

Procedure A-17
August 26, 1963

ORE: Libby #3
VAC: 75-80 unless otherwise specified
PRODUCT: FIRE-TROL AGGREGATE

1. This product will be straight run #3 Vermiculite over scalping screen (see D-2 screen assemblies) with air-borne fines removed from all production runs.
2. Fire-Trol will be produced with a minimum of 4 oz. maximum 6 oz. of stabilizing agent (C-9 by Hercules Powder) per 4 cu. ft. bag. Introduce stabilizing agent with automatic measuring device at bagging hopper.
3. Bag in plain 4 cu. ft. bag. Attach label provided with following marking "FIRE-TROL AGGREGATE".

Labels to be supplied by Fire-Trol Company, Chicago.
4. This product TO BE SOLD ONLY TO LICENSED FIRE-TROL Manufacturers for use in fabrication of Fire-Trol Columns.

Bag Content: 4.1 cu. ft.
Bag Weight Limits: 24-36 lbs. *
Bag Weight Goal: 25 lbs. (Spec. Minimum 24 lbs.)
Rock Content: REMOVE ALL POSSIBLE

PLANT STANDARDS

U.S. Screen	3/8	4	8	16	30	50	100
Cumulative % by Weight*	0	0-2	0-40	15-60	55-95	80-98	90-100

* SPECIFICATIONS ESTABLISHED BY U.L. 5/7/63 R-3966 Sp. Vol. I

PRODUCTION DEPARTMENT
Max F. Corso

Procedure A-19

October 7, 1964

ORE: All Vermiculite

PRODUCT: MICACEOUS FILLER KW-1
(-12 Mesh Fines)

This product will be taken from all furnace cyclones
(fitted with 12 mesh gravity screening device) when
processing uncoated vermiculite products. *

Bag -12 mesh fines in plain kraft bag sewn closure.

Properly stencil or mark bag "Micaceous Filler KW-1".

(DO NOT IDENTIFY WESTERN MINERAL AS THE MANUFACTURER)

This product sold by the ton. All shipments must be
accounted for on weight basis.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 44-60 lbs.

PLANT STANDARDS

U.S. Screen	16	30	50	100	-100
% By Volume	0-5	0-35	25-75	65-100	0-35

* Asphalt coated fines are not acceptable as Micaceous Filler.
Do not accumulate asphalt coated fines.

PRODUCTION DEPARTMENT

Max F. Corso

MFC/mr

Procedure A-20

October 27, 1964

GENERAL INDUSTRIAL VERMICULITE

Product and Ore Code Sheet

The following materials have been established for code identification of Industrial Vermiculite:

<u>PRODUCT CODE</u>	<u>SOURCE</u>
LO-0	Libby #0 Ore
LO-1	Libby #1 Ore
LO-2	Libby #2 Ore
LO-3	Libby #3 Ore
LO-CA	Libby C.A. Ore
LO-4	Libby #4 Ore
Ind. 00	Expanded #0 (Libby)
Ind. 100	Expanded #1 (Libby)
Ind. 200	Expanded #2 (Libby)
Ind. 300	Expanded #3 (Libby)
Ind. 400	Expanded #4 (Libby)
Ind. A-300	Expanded African #3

1. Follow normal procedures for expanding unless otherwise directed.
Bag in plain sewn 4 cu. ft. bag.
2. Always mark bag with appropriate code identification.

PRODUCTION DEPARTMENT

Max F. Corso

MFC/mr

SECTION "B" - PERLITE

- B-1 Perl-Crete
- B-2 Perl-Ag
- B-3 Perl-Flote
- B-4 Texture Finish Aggregate
- B-5 Perl-Trowl
- B-6 Perltext
- B-7 Fines Aggregate for Plaster Mix
- B-8 By Product Fines
- B-9 Perltext Texture Granules R-GD-10 (Coarse for Texture Products)
- B-9A Perltext Texture Granules (Coarse Perltext Aggregate for Pagan-Zonolite)
- B-9B Perltext Texture Granules U-GD-10 (Medium Coarse for Texture Products)
- B-9C Perltext Texture Granules Dry Wall Supply U-GD-10
- B-10 Perltext Texture Granules PR-GD-10 (Medium for Texture Products)
- B-11 Perltext Texture Granules LY-GD-10 (Fine for Texture Products)
- B-11A Perltext Texture Granules LY-GD-14
- B-12 Perltext Texture Granules GD-D-10 (Extra Fine for Texture Products)
- B-13 Perltext Texture Granules R-D-10 (Mpls. Only)
- B-13A Perltext Texture Granules U-D-8 (Mpls. only)
- B-14 Perltext Texture Granules PR-D-8 (Mpls. Only)
- B-15 Perl-Gro
- B-15A Perl-Gro, Coarse (Mpls Only)
- B-16 Duwe Crete
- ~~B-17 All-Weather Crete~~
- B-18 Tile Crete
- B-19 Conspeco Crete
- B-20 Versi-Tex (Minneapolis)
- B-21 Mautz-Tex (Minneapolis)
- B-22 Industrial Perlite Code

} Perltext
Paint Division
Only

Revised October 7, 1965

Outdates September 14, 1962

PERLITE MANUFACTURING PROCEDURE
AND SCREEN ANALYSIS SPECIFICATIONS

ORE: UP-19 Coarse Blend (Minneapolis)
JM4S1 (Omaha)
UP-21 Fine Blend (Milwaukee)
UP-22 50% + UP-11 50% (Denver)

PERL-CRETE

Not less than one product analysis per shift. Product must meet standards as listed below including when blending in +16 and +24 material. All Perl-Crete to be produced stabilized unless otherwise specified. If plain, mark the bag with a large "P". Air drawn fines to be removed.

NOTE: Stabilizing agent - Vinsol NVX, Hercules Powder Company
Quantity per 4 cu. ft. bag - 3½ to 4½ oz., goal 4 oz.

Manual addition, Omaha and Denver plants:

Allow the bags to stand open and cool for 10 to 15 minutes.

Add one measured cup (4 oz.) of N.V.X. on the top of bag and
VIGOROUSLY stir into the top portion of the bag.

ANY N.V.X. NOT THOROUGHLY MIXED WITH AGGREGATE CAUSES TROUBLE
WHEN USED AND WILL RESULT IN CLAIMS AGAINST THE PLANT.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 34-40 lbs.

Bag Weight Goal: 36 lbs.

U.S. Screen Size	4	8	16	30	50	100	-100
* Cumulative % By Weight	0	0-15	15-60	40-80	75-95	90-100	
WEMPCO Goals		10	35	70	85	95	
Bulk Weight #/cu. ft.	6+	6+	6+	6+	6+	5+	

* ASTM Designation C332-56T "Tentative Specifications for Lightweight Aggregates for Insulating Concrete".

PRODUCTION DEPARTMENT

D. P. Wesenberg

DPW/mr

Procedure B-2
Revised January 6, 1964
Outdates March 6, 1965

ORE: JM310
UP13 (Coarse Blend)
UP-22 15% + UP-11 85% (Denver Plant)
Alternates:
UP-14
CM-16
NA#73 Wempco Special

PERL-AG

Shall meet standards as indicated, on the coarse side of
range insofar as possible. Not less than one product
analysis shall be taken on each shift.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 30-36 Lbs.

Bag Weight Goal: 32 Lbs.

U.S. Screen Size	4	8	16	30	50	100	-100
ASTM Standard Cumulative % by Volume C-35-62	0	0-5	5-60	45-95	75-98	88-100	
WEMPCO Goals	0	0	30	70	90	*96	
Bulk Weight #/cu.ft.	0+	6+	6+	6+	6+	5+	

*Absolute minimum 90%. Do not ship product containing more than 10%
100 mesh material.

PRODUCTION DEPARTMENT
Max F. Corso

Procedure B-3

Revised April 15, 1965

Outdates September 1, 1960

ORE: CM-40
CM-16
J-M PA 3
J-M PA 2
J-M PA 150
UP-11
UP-9

PERL-FLOTE

(-16 +50)

Expanded material shall be passed through the Sweco Sifter with -16 +50 material being bagged in 2 cu. ft. Perl-Flote bags with sewn closure. The +16 mesh material is to be bagged in plain sewn bags. This material may be used for "Perl-Kor" with WEMPCO label attached. (Do not use top size of -40 or 150.) Not less than one product analysis each run.

Bag Content: 2 cu. ft.

Bag Weight Limits: 16-20 lbs.

Bag Weight Goal: 18 lbs.

PERL-FLOTE

WEMPCO STANDARDS

U.S. Screen Size	16	30	50	100	-100
Cumulative % by Volume	0	40-70	75-100	95-100	
Bulk Weight #/cu. ft.	0+	7+	7+	7+	5+

Production Department

D. P. Wesenberg

DFW/mr

Procedure B-4

Revised April 15, 1965

Outdates September 1, 1960

ORE: J-M PA 150
J-M PA 2
J-M PA 3
UP-11
CM -16
CM -40

* See Footnote Below

TEXTURE FINISH

AGGREGATE FOR SPRA-WYT

(-16 +50)

Expanded material shall be passed through the Sweco Sifter with the -16 +50 material placed in 4 cu. ft. plain bags and identified as Spra-Wyt Aggregate. The +16 mesh material is to be bagged in plain sewn bags. The +16 may be used for Perl-Kor with WEMPCO label attached. (Do not use top size of -40 or 150 for Perl-Kor. +16 from -40 may be blended back into Perl-Ag providing weight of 4 cu. ft. bag exceeds 24 lbs.)

Not less than one product analysis each run.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 30-34 lbs.

Bag Weight Goal: 32 lbs.

TEXTURE FINISH AGGREGATE

WEMPCO STANDARDS

U.S. Screen Size	16	30	50	100	-100
Cumulative % by Volume	0	40-70	75-100	95-100	
Bulk Weight #/cu. ft.	0+	6+	6+	6+	5+

* -16 +50 material for Texture Finish Aggregate shall be as white as possible.

Production Department

D. P. Wesenberg

Procedure B-5

Revised August 31, 1965

Outdates April 15, 1965

ORE: CM-40

UP-11

UP-9

J-M PA 100

J-M PA 150

Preferred procedure is to scalp from all regular product runs such as Perl-Gro, Perl-Crete, etc., however, if necessary produce from one of the listed ores.

PERL-TROWL

(-24)

Expanded material shall be passed through the Sweco Sifter with -24 material being bagged in 2 cu. ft. Perl-Trowl bags. Care must be exercised to see that this product does not contain coarse particles.
No +24 mesh material in this product.

Not less than one product analysis each run.

Bag Content: 2 cu. ft.

Bag Weight Limits: 12-20 lbs.

Bag Weight Goal: 16 lbs.

PERL-TROWL

WEMPCO STANDARDS

U.S. Screen Size	16	30	50	100	-100
Cumulative % by Volume	0	15-35	50-80	70-90	
Bulk Weight #/cu. ft.		5+	5+	5+	5+

Production Department

D. P. Wesenberg

DPW/mr

Revised April 15, 1965

Outdates December 14, 1964

ORE: CM -40
J-M PA 150

PERLTEX (Minneapolis - Omaha)
(-24 +50)

Expanded material for Perltext products shall be passed through Sweco Sifter with -24 +50 material in plain sewn bags (50-58 lbs, 54# goal). The +24 material may be blended back in Perl-Ag providing weight of 4 cu. ft. bags exceeds 24 pounds.

The -24 +50 material will be placed in the semi-automatic measure Perltext bagger and packaged as follows:

#1 Package - set slide valves on measuring device to deliver 1050 ml (plus) (7 oz. min.) into #1 tin tie package. Place 12 packages in #1 Perltext case and seal.

Approximate weight case: 12 pack - 7-9 lbs.

#5 Package - set measuring device to deliver 5250 ml (plus) (2 lb. 4 oz. min.) into #5 package. Place 12 packages into #5 Perltext case and seal.

Approximate weight case: 12 pack - 29-35 lbs.

#60 Perltext- fill 2 cu. ft. bag or drum (2 cu. ft.) and label #60 Perltext.

Approximate net weight: 25-29 lbs.

Net weight goal: 27 lbs.

4 cubic foot Perltext - fill bag or drum (4 cu. ft.) and label 4 cu. ft. Perltext.

Approximate net weight: 50-58 lbs.

Net weight goal: 54 lbs.

PERLTEX
WEMPCO STANDARDS

U.S. Screen Size	16	30	50	100	-100
Cumulative % by Volume		0-5	50-95	93-100	0-7
Bulk Weight #/cu. ft.		9+	9+	9+	9+

Production Department

D. P. Wesenberg

DPW/mr

Procedure B-7
January 8, 1964
Outdates September 1, 1960

ORE: UP-100
JM-110 - JM 1000 Blend (Omaha)
GLC-00

PRODUCT: FINES AGGREGATE FOR PLASTER MIX
(-16 Mesh)

This material is specifically manufactured to be blended with by-product cyclone fines to control density and analysis of fine aggregate used in the manufacture of Plaster Mix Products. Care must be exercised in ore handling to prevent contamination.

Material must be passed through Sweco Sifter with 16 mesh screen used as scalping screen to remove objectionable sizes and impurities. Bag in plain bags (or cloth bags) and identify as manufactured fines.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 36-40 lbs.

Bag Weight Goal: 38 lbs.

U.S. Screen Size	16	30	50	100	-100
Cumulative % By Volume	0	0-5	20-45	70-90	
Bulk Weight #/cu. ft.	0	3+	3+	3+	3+

PRODUCTION DEPARTMENT

Max F. Corso

MFC:bs

Procedure B-8
September 1, 1960

BY PRODUCT FINES

By-product fines shall be bagged directly from the final cyclone in plain bags, sewn closure, or cloth bags as directed.

Bag Content: 4.1 cu. ft.

Bag Weight Limits: 30-40 lbs.

PRODUCTION DEPARTMENT

Max F. Corso

WGC:mc

P



NON RESPONSIVE